ADVANCE LAND ACQUISITION BY LOCAL GOVERNMENTS

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ADVANCE LAND ACQUISITION BY LOCAL GOVERNMENTS

benefit-cost analysis as an aid to policy

by
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INTRODUCTION

This study is the first systematic analysis of the costs and benefits of an underused tool in urban development and redevelopment: advance land acquisition for public facilities.

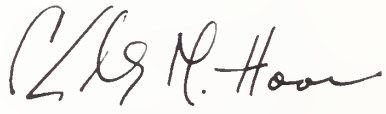
Advance acquisition, if used imaginatively and on a large enough scale, can be a powerful tool for implementing comprehensive planning and guiding desirable urban growth. It can also save hard pressed governments substantial amounts of money where local land prices are skyrocketing. But the use of this tool is not without its costs. These include the cost of borrowing money or the "cost" of current benefits foregone when funds are invested to meet future needs, the loss of tax dollars when land is taken out of private ownership, and the uncertainty as to the future urban needs and patterns of development.

This study develops guidelines for localities to help them weigh both costs and benefits in making the decision to invest in land to meet future needs. The cost-benefit method used should also have value to communities with respect to other decisions on how to invest public funds. Although many decision making techniques are available, it is clear that those which are less

systematic than that presented here are not adequate to commit billions of dollars in local funds in a manner that will maximize the public benefit.

The Federal Government has been concerned with the problems of urban land price escalation for many years. This concern led to the sponsorship of this study, and the creation of the Advance Acquisition of Land Program as part of the Housing Act of 1965.

But advance acquisition is just one of a series of tools which should be explored to conserve local expenditures and achieve some mastery over the shape of our future urban environment. It is hoped that this study will focus attention on the problem so that local governments will be stimulated to find imaginative ways to deal with problems of runaway land costs and the disappearance of lands best suited for public uses.



Charles M. Haar
Assistant Secretary

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FOREWORD

This monograph reports on a study which aims to answer a practical question: Under what circumstances should local governments anticipate the need for land by purchasing it well ahead of expected use? The problem is explored by building on a form of economic analysis that has been developed in recent years in connection with water resource development and other public investment decisions. This technique—cost-benefit analysis—consists of listing advantages and disadvantages and trying as far as feasible to quantify them. The analysis also leads to suggestions about how a program in advance acquisition should be administered.

SETTING OF THE PROBLEM

The purchase of land by local governments will have to increase heavily in the years to come. A conservative estimate of expenditures for real estate places the figure at about 12 percent of the entire projected capital budgets for state and local governments. Thus, expenditures for land (and existing structures) are expected to come to about $4 billion a year in the decade immediately ahead (p. 10).

The increased need for public expenditure on land will result partly from the large increase in the number of people in the country, most of whom will wish to live in cities. Population estimates by the Bureau of the Census range from increases of somewhere between 85 and 161 million people by the year 2000. This could easily double the urbanized area of the country (p. 10). Corresponding increases will be required for new public facilities just to maintain the level of public services now ordinarily provided by state and local governments. But standards for urban and state services are rising, just as are all aspects of the standards of living enjoyed by the inhabitants of this increasingly affluent society. Indeed, the sorts of services that require relatively large amounts of land, such as recreation, schools, and transportation, tend to increase faster than most other government services.

These extensive acquisitions of land by public bodies will almost inevitably be made at prices subject to a substantial rising trend. This is indicated by the three major studies reviewed in Chapter 6, which showed average rates of rise in land prices of 8, 10, and 10 percent per year, respectively, for the years 1946 to 1964, 1950 to 1962, and 1960 to 1964.

In the face of these implacable trends, how can local governments contrive to acquire efficiently the properties that they will need as sites for the services they will provide? Clearly if they wait until the land must be put to use, the most appropriate properties will have been preempted by the very private development that created the need for the additional government services. Moreover, whatever sites are eventually acquired, it is likely that the cost will be much higher than if they had been bought earlier.

One answer to the dilemma is to anticipate the need for land and purchase it in advance. The importance of this approach has been recognized by the federal government in several recent pieces of legislation. They aim to aid local governments to acquire land in advance for use in recreation, airports, urban renewal and other purposes.

A number of local governments have themselves begun to acquire land before it is actually needed. The results of a questionnaire survey (reported in Chapter 2) suggest that somewhat less than 30 percent of the cities of over 50,000 inhabitants in the United States carry on some sort of advance acquisition activity. However, the programs tend to be small—typically less than six acquisitions per year. Schools and parks are the most usual purposes for which cities acquired property in advance, though other specific future facilities were sometimes covered. No large-scale plans for influencing orderly land development were reported.

The European picture of advance land acquisition by governments is quite different. Many countries in Europe have active policies for acquiring undeveloped land in order to control the pattern of urban extension. Of these Stockholm, where much of the land surrounding the central city was acquired early in the century, is the most famous example (see Chapter 9).

THE VALUE OF ADVANCE LAND ACQUISITION TO LOCAL GOVERNMENTS

Though the records are sparse, advance land acquisition in this country seems capable of producing good results. For example, two case studies of advance acquisition programs, on which Chapters 7 and 8 report, illustrate what can be accomplished. For a sample of 17 school sites acquired in advance of need by Montgomery County, Maryland, the average dollar saving has been $50,000 per site after all costs have been taken into account. Of a sample of 21 sites which Richmond, Virginia has acquired in advance for expressways, street widenings and school additions, the average saving (after an allowance for mistaken expectations) was $32,000 per site. In addition to the dollar savings there were other benefits that in some cases were more important than the dollar-measured benefits. In Montgomery County the program makes it possible to get the sites best suited for schools before private development forecloses the opportunity. And in Richmond, advance land acquisition has strengthened and has become an integral part of the planning process, enabling the city to make long range plans for its future construction projects with the knowledge that the necessary sites will not be put to some incompatible use in the interim.

WEIGHING THE ADVANTAGES AND DISADVANTAGES OF ACQUIRING LAND IN ADVANCE

A major purpose of this study is to provide a framework for considering both the benefits and the costs to the public of acquiring land in advance of need. "Benefits" should be regarded as any advantage and "costs" as any disadvantage regardless of how adequately they can be evaluated. Actually, most of the costs and a substan-

tial part of the benefits of advance acquisition can be measured in dollars, at least in an approximate fashion, and where this is possible it has been done. But several of the benefits are hard to quantify; these must nevertheless, be weighed in order to arrive at a judgment. What are the benefits of advance land acquisition? And what are the costs?

How benefits should be measured is contingent on whether or not land that has been purchased in advance can be sold as readily as it is bought. Land should, of course, be sold if it becomes evident that it will not be needed for its intended or a substitute purpose. But it should also be sold if it turns out that other equally acceptable properties becomes available at a lower cost. How cost should be defined is indicated by examining the benefits of advance acquisition. However, these benefits would need to be defined differently were it not for the assumption, which is made throughout this study, that sales are made if and when they should be.

1. *Forestalling price rises.* A major benefit is the saving to the local government when land is bought early and prices subsequently rise. Savings occur not only because of the general upward trend in the price of land, but also because land prices commonly jump during conversion from rural to urban use. For areas in the path of urban extension, this saving alone will often outweigh all cost of the advance acquisition. (The Montgomery County program is a case in point.)

2. *Getting the "best site."* "Obtaining the best location" was the most usual reason designated as "most important" by cities reporting on their advance acquisition programs.

Some sites are typically much better suited to a particular public purpose than are others. Advance acquisition can make it possible to acquire these best sites for a school, a park, or whatever, before private development has greatly increased their cost. Indeed, were it not for the right of eminent domain, private development might entirely bar many developed properties from subsequent public use. But even though governments can condemn land, they must pay to acquire it and pay to acquire and demolish any new construction that has taken place; in addition, relocation problems and political embarrassment may ensue. Advance acquisition forestalls these additional costs and thereby makes it possible to acquire "best sites" at a cost which is advantageous in view of the capacity of the land to provide the government service for which it is desired.

3. *Improvement in the pattern of related land uses.* Advance acquisition can encourage desired private land development by offering practical evidence of intended future provision of public facilities and services. This will act to strengthen the planning process of the local government and to reduce the uncertainty attached to other public and private investment decisions which are affected by the location of future public facilities. This is, of course, a very difficult benefit to evaluate, and requires considerable judgment as to its importance in different circumstances.

4. *Improved procedures for site selection.* A probable benefit from undertaking a program of advance acquisition is an improvement in the procedures of selecting sites for public facilities. There is more time to study site requirements if selection is made in advance, and there is more opportunity for coordinating the selection of sites of all public facilities.

5. *Return on temporary use.* Land being held for future use can produce income while it is being held, or can serve some useful public purpose.

Of this list of benefits, numbers 1 and 5 are readily subject to dollar measures, while numbers 3 and 4 are almost impossible to value in dollars and number 2 is intermediate. Thus, the advantage of any particular advance acquisition is likely to consist of a combination of both dollar-measurable and intangible benefits.

The principles for measuring benefits numbers 1 and 2 are difficult to summarize. Suffice it to say that their sum is a function of the difference between what is paid for a

property and what the government would be willing to pay at the time the property is to be put to use. However, the market price of the land at that date provides a floor below which the benefit cannot fall, providing, of course, sale is unimpeded. The determinants of what governments should be willing to pay are discussed in Chapter 4.

The costs of advance acquisition, on the other hand, are usually amenable to dollar measurement. They are:

1. *Cost of capital.* The money invested in land sometimes needs to be borrowed and therefore involves an interest cost. But even if money is available without new borrowing, there is actually a cost of tying it up in land: the benefit of other uses to which it could be put must be given up. This "opportunity cost" is also measured by the interest rate. When the local government can borrow additional funds without impairing its credit rating, a good case can be made for using the borrowing rate on municipal bonds as the cost of capital that is tied up by the advance land acquisition.

2. *Lost property taxes.* Since advance land acquisition removes property from the tax rolls, the local government loses a stream of property taxes that would be paid if the land were left in private ownership until the time of actual need. The size of the foregone taxes depends, of course, on the property tax rate. But it also depends on the assessed valuation that is appropriate. If no private construction is prevented by the acquisition, the assessed value of the existing property can be used, though it should be adjusted for an expected rise in property values. If the advance acquisition prevents new private construction which would otherwise have taken place, the tax loss on the new improvements must also be considered, unless there is reason to believe that the improvements would simply be displaced to another part of the municipality.

3. *Management expenses.* There are administrative expenses associated with running an advance acquisition program. Most of these tend to be of an overhead variety. They include the expense of ongoing acquisition planning and the general provisions for managing acquired property. In areas where there is already a planning organization and real estate department, this is probably not a large cost, but in smaller communities it may be more of a problem.

THE DECISION TO ACQUIRE

The major benefits of acquiring land in advance must in some sense be added together and the costs subtracted in order to judge the net advantage or disadvantage and, thereby, whether the particular advance acquisition is worth undertaking. The analysis concentrates, of course, only on the matter of the advantage of acquiring land *in advance* and assumes that an expected need for land has been established.

"Present Values." One technical problem is encountered immediately: only comparable things can be added, and a benefit that will be received, or a cost incurred, in the future is not comparable to one received today. The benefit is less valuable if it is put off since it will be enjoyed for fewer years. The future cost is less burdensome since the resources can be put to other uses in the meantime.

In connection with advance acquisition, both costs and benefits occur at different times and to put them all on a comparable basis it is necessary to convert each to a single point in time—the time when the decision must be made. This can be done by using the well known technique of the discounting method appropriate to converting every cost and every benefit to its "present value." Thus, the benefit of appreciation in the value of property is felt at the time that the property is put to use (had it not been bought in advance, one would have had to pay more for it at that time). If, say, $10,000 is paid for land to be used in ten years, at which time it is expected to be worth $18,000, the benefit today is not $8,000, but the sum that would have to be invested today to grow to $8,000 ten years hence. At any discount rate selected, the present value of a benefit received or cost incurred in any future year can be looked up in standard mathematical tables. To illustrate, if the annual cost of waiting

is put at 4 percent, the benefit from a dollar received five years hence is worth today 82 cents. If it were received ten years hence, it would be worth 68 cents today; thus, the present value of the $8,000 appreciation is $5,400. Similarly, a cost of one dollar incurred ten years hence hurts only 68 cents worth if the advantage of waiting (the earnings of the dollar in the meantime) is put at 4 percent. How this principle is applied to the costs and benefits of advance acquisition is described in a general way in Chapter 3 and examined in more detail in Chapters 4 and 5.

Uncertainty in Estimating Costs and Benefits. Granted then that all costs and benefits have to be converted to their present values there still remains the problem of arriving at an estimate of what they are expected to be. For the major costs, the estimates are straightforward since tax rates and the appropriate interest cost can be determined with reasonable confidence. For benefits, estimation is often more difficult: Does it seem likely that land prices will rise and, roughly, how fast? How much more productive is a site that can be acquired now but would probably be unavailable in later years? Questions of this sort need to be answered. Chapter 6 examines the circumstances in which answers may be more confident or less confident. For some sorts of benefits, such as improved planning and selection procedures, dollar value estimates, however vague, are virtually impossible; nevertheless, they must not be ignored.

Judging the Net Advantage. Expected costs then are relatively measurable and sure; expected benefits can range from measurable and sure through various degrees of measurability and probability. This suggests a procedure of evaluation.

Say costs come to about 6 percent a year (4 percent interest and 2 percent tax). Then if prices can be quite confidently predicted to rise at least at this rate (as in Montgomery County), or when the cost of demolishing new construction would bring the price rise well over the 6 percent figure (as in Richmond), advance acquisition is clearly worthwhile. The benefit of better sites, improved planning, and the like are simply an additional bonus. At other times, uncertainty about the course of prices will imply that the benefit of the best site needs to be evaluated, albeit roughly, to decide whether benefits may be expected to exceed a 6 percent rate. Analogously, under still other circumstances intangible benefits may need to be carefully evaluated.

The analysis implies that good *average* results are easier to achieve than are clear benefits in each undertaking. At best the *chances* of what will occur can be evaluated, but unpredictable occurrences will inevitably influence the actual outcome. This fact carries an important message about how to organize an advance acquisition program.

ADMINISTERING ADVANCE ACQUISITION

Sometimes a large acquisition must be viewed as an entity, and acquisition is not justified unless it seems clear that the most adverse results that are at all likely can be tolerated, and the more likely ones clearly advantageous.

Pooled Programs. But for many sorts of acquisition problems the work should be set up so that *average* results dictate the success of the program. To this end it is important to consolidate acquisition of as many kinds of sites as possible in one department. As previously mentioned, it is also essential that the department be free to sell properties when they turn out not to be needed, or when cheaper or more suitable alternatives become available.

Other Guides. Proper administration can provide other ways of reducing the risk of adverse results. They are discussed at the end of Chapter 10. The ways include proper accounting systems, interdepartmental information systems, and selection of appropriate techniques of reserving land. Finally, results can be improved through cooperation among local governments and by utilization of the powers of the federal government to bring a wider framework to bear on the definition and pursuit of public advantage from anticipating the need for land.

Chapter 1

THE SETTING FOR ADVANCE ACQUISITION

The amount of land that contributes to the ever-increasing stream of goods and services enjoyed by the American people is not only fixed but in one sense actually diminishing. Acceleration of the historic trek from farms to cities has elevated the importance of land in the neighborhood of cities relative to the large and increasing stretches of less than optimal farm land for which there seems, at present, little use.

These resolute trends have turned the minds of prudent people to the anticipation of future needs for land. It is not uncommon, for example, for large companies to acquire sites well ahead of expected requirements.[1] Assembly of large areas of industrial parks is the work of some 2,000 industrial park developers and as many community industrial development groups.

The same considerations that prompt the exercise of foresight by private enterprises apply with greater force to governments. Governments, of course, have a wider responsibility—that of protecting and furthering the public interest in rational land use

1. *The Wall Street Journal*, December 8, 1965, discussed the subject in a very interesting article by Laurence G. O'Donnell entitled, "Many Firms 'Stockpile' Plant Sites They Won't Get to Use Right Away." O'Donnell mentioned recent purchases by five industrial companies that total about 10,000 acres.

as a whole. The magnitude of this responsibility is suggested by some numbers. The population of the United States is expected to grow from 195 million in 1965 to between 280 and 356 million by the year 2000,[2] and all of the increase will probably lie in urban areas. This growth in urban population will require new urban development accommodating between 85 and 161 million people. The magnitude of the task is suggested by the fact that the existing urban population was about 125 million in 1960.[3]

The growth in terms of land devoted to urban uses will also be dramatic. Estimates of future land use, however hazardous, provide a notion of orders of magnitude. One group of specialists, for example, estimates that the land devoted to urban uses will grow from about 16½ million acres in 1950 to about 41 million acres by the year 2000. Most of this increase in urban land will probably occur where there is now a town or city.[4]

This growth in urban population and area will obviously require a large investment in new public facilities just to maintain the level of public services now ordinarily provided by state and local governments. Prediction is difficult, but the most comprehensive estimate of state and local capital requirements over the coming decade, 1966 through 1975, is that $328 billion will be needed for new public facilities.[5] This may well imply that state and local governments will be spending about $4 billion a year on the acquisition of land and existing structures during the years immediately ahead.[6]

In any event, it is clear that there will be a rapidly expanding need for land by public bodies in the near future. State and local government services are a rapidly expanding sector of the national economy. Accordingly, the need for sites on which to locate government services grows at a correspondingly rapid rate. Furthermore, some of the rapidly growing segments of government service itself are land-extensive—provision of recreation and green belts, transportation facilities, water reservoir and delivery systems adequate not only to the growth of cities but also to changing requirements and standards. The acceptance by governments of the charge to stem the decay of cities and to provide low-income housing is still another recently emphasized area of government service for which land acquisition is large and sometimes particularly difficult.

Yet there are a number of factors that exacerbate the difficulties involved in acquiring sites in advance for the production of services when governments, rather than private enterprises are the producers.

For one thing, local governments are creatures of a defined geographic area. Their land needs tend to lie within the city area or close to it. They cannot ordinarily move to where satisfactory land is available, as can an industrial plant. The mountain must be found alongside of Mohammed. Also, politics often embarrasses advance land acquisition in at least two ways. Negotiation of a purchase tends to be too slow and too public to proceed expeditiously, to put the matter most conservatively. Second, it is hard for a public official to resist the push of noisy present needs in favor of expected future require-

2. U.S. Bureau of the Census. *Statistical Abstract of the United States: 1966. (Eighty-seventh edition.)* Washington, D.C., 1966, p. 8.

3. Ibid., p. 15.

4. Marion Clawson, R. Burnell Held, and Charles H. Stoddard. *Land for the Future.* Washington, Resources for the Future, Inc., 1960. p. 111.

5. U.S. Congress, Subcommittee of the Joint Economic Committee. *State and Local Public Facility Needs and Financing.* 89th Cong., 2d Sess., 1966, Vol. 1, p. 13.

6. This estimate starts with the figure of $328 billion for the decade 1966 through 1975 and endeavors to distinguish between the cost of land and of new construction. In 1964–1965, about 12 percent of all capital outlay by state and local governments was for the purchase of land and existing structures. (*State and Local Public Facility Needs and Financing*, Vol. 2, p. 55.) If this proportion is maintained into the next decade, state and local governments will be spending about $39 billion on the acquisition of land and existing structures between 1966 and 1975. Actually, this may be somewhat of an underestimate, because since 1952 there has been a pronounced upward trend in the proportion of state and local capital outlays accounted for by purchase of land and existing structures (the proportion was only 6.3 percent in 1952, 9.5 percent in 1957, and 11.1 percent in 1962).

ments. Present needs push very hard indeed; if he chooses to look ahead toward advance acquisition, the official may not be around to enjoy the approval that his foresight deserves.

Against this background of large, growing, and difficult problems of providing land for government activities, the beginning of concerted efforts to rationalize and improve procedures are moving into focus.

One set of stimuli and incentives comes from the various manifestations of "fiscal federalism." Federal encouragement and financing of state and local programs have been important in fields such as urban renewal, transportation, community facilities for water and sewerage, outdoor recreation, and planning for area development and growth. Each of these targets of public action has a land acquisition aspect for which advance acquisition offers strong advantages.

The Housing and Urban Development Act of 1965 contained a provision which made federal grants available to cover interest charges for five years on land purchased in advance for many sorts of public purposes. In the discussions at the hearings of Section 604 of this Act, the link between advance acquisition of land and other matters to which federal legislation has been devoted was well spelled out:[7]

> The objective of this Federal assistance is to encourage communities to plan ahead, in connection with their future public works needs, with respect to land acquisition as well as preparation of construction plans. Under Section 702 of the Housing Act of 1954, the Housing Administrator is authorized to make interest-free advances to finance the planning of specific work. But the advance acquisition of sites is equally important in helping to attain maximum economy and efficiency in the construction of public works. Such advance site acquisition would be assisted by the new program.
>
> By encouraging communities to anticipate the site requirements for future public works constructon and by assisting them for the timely acquisition of the land that will be used in such future construction, the new program will help to produce a number of savings. Local public bodies will be assured of the availability of appropriate sites and will save by acquiring sites before the rising trend of land prices increases their costs. Advance acquisition before there is further construction on a site would avoid the costs of demolishing such construction, relocating the occupants of the buildings, and disrupting businesses. Advance knowledge regarding the site location of future public works would enable private land developers and builders to make appropriate adjustments in their construction plans or schedules which would lead to more orderly growth in the area.

In this country, the growing recognition of government responsibility to improve urban land use has been partly stimulated by advances in other countries. In 1965, for example, the U.N. Economic Commission for Europe held a seminar on "The Supply, Development and Allocation of Land for Housing and Related Purposes." The seminar was a response to the fact that land problems had been of serious concern to many of the countries participating in the work of the Economic Commission for Europe. In the words of the conference chairman, "The scale and rapidity of urbanization are compelling Governments of nearly all countries to adopt an urban land policy. This offers them, moreover, the indispensable means of planning in space and time the inevitable extension of their urbanized territory."[8] In capitalist as well as socialist countries, participants disclosed similar basic problems in improving the process of urban growth by means of diverse land use controls, including outright public acquisition.

7. U.S. Congress, House. Banking and Currency Committee. *Housing and Urban Development Act of 1965. Hearings before Subcommittee on Housing*, 89th Congress, 1st Session, on H.R. 5840, 1965. Pt. 1, pp. 209–210.

8. Introductory remarks of the chairman of the seminar, Mr. R. Mace, United Nations Economic Commission for Europe, *Proceedings of the Seminar on the Supply, Development and Allocation of Land for Housing and Related Purposes*. ST/ECE/HOU/15. New York, United Nations, 1965, Volume 1, p. 8.

Problems, then, in the anticipation and planning of the future need for land range from the particular to the general—from the anticipation of a need for a schoolhouse or fire station in a particular part of a particular city to the wide-scale planning and implementation of critical aspects of urban development. On all of these fronts, public interest and awareness of public responsibility appears to be building.

Standards for dispatching public responsibility likewise are undergoing rapid change. There has been concentrated study in recent decades of management science in business. Much of the initial thrust of this work came from the Department of Defense; its full impact is now turning back on government offices of all descriptions. More and more, we are asking for efficient methods of spending public funds. The economics of government expenditure is taking its place alongside of the age-old economic field of fiscal finance, concerned primarily with government revenues. This work in the area of expenditure analysis is called by many names—operations research, administrative economics, cost-benefit analysis, systems analysis, planning, programing, and budgeting systems ("PPBS"). But whatever the name, it consists basically of an effort to think tightly, using the remarkable gadgetry of economic analysis, about the advantages, disadvantages and other impacts of specified actions with a view to improving the result.

The advance acquisition of land intended to be used for public purposes is a subject well suited to the enumeration and evaluation of advantages and disadvantages. The enumeration must cover values of a qualitative sort, such as the availability of more suitable land if it is acquired before development "removes" it from the market. It also must cover the narrowly economic values of money savings, such as those resulting from forestalling a rise in prices. Of course, a comparison of costs and benefits is neater in connection with values that can be adequately measured in dollars. And fortunately for many kinds of advance land acquisition, a relatively large part of benefits and costs are subject to fairly adequate measurement. Even primarily qualitative benefits, such as the availability of better sites than could otherwise be purchased, are often subject to some very rough quantitative evaluation. Thus, advance land acquisition is particularly suitable to economic analysis of costs and benefits interpreted, as we do throughout, to include *all advantages and disadvantages* whether or not they can be evaluated by a dollar measuring stick.

Accordingly, there is reason to hope that it will prove useful to study very carefully the circumstances under which it is more advantageous to buy a property ahead of time than to wait until it is actually needed. The answer will necessarily have administrative and institutional (including legal), as well as economic, dimensions. This monograph reports on such a study. It deals primarily with the purchase of land rather than with the many other ways in which land can be reserved for public purposes.

It deals primarily with sites expected to be required for production of some public service. It concentrates on their advance acquisition and considers only tangentially the many ways short of fee simple purchase whereby land can be reserved for public purposes. Also, it avoids, except in Chapter 9, the important problem of how large-scale land purchase, along with other broad land-use controls, can improve the process whereby cities spring up, intensify and extend.

Chapter 2

EVIDENCE ON THE PRESENT USE OF ADVANCE ACQUISITION

Having indicated some of the problems to which advance land acquisition in urban environments is addressed, the next question concerns how often advance acquisition has actually been used to solve them. This chapter tries to answer the question by reporting on two special surveys as well as on more general sources of information. The description focuses, as does this monograph as a whole, on advance land acquistion by local governments in this country. Finding programs not common and very limited in scope, we ask whether the fact may be explained by legal inhibitions; to anticipate, this does not appear to be a primary explanation.

TYPES OF ADVANCE LAND ACQUISITION

Advance acquisition of a site on which a firehouse will be placed is a very different thing from advance acquisition of the area now known as New York City's Central Park. In order not to count these mice and elephants each as one, it is essential to distinguish three major types of advance acquisition. They are not only quite different animals, we find, but also need quite different handling.

First, small or medium size parcels of land can be acquired in advance of need for such ubiquitous public services as schools, fire stations, libraries, neighborhood parks, or government buildings. Local governments of any size require a large number of these sites in order to provide basic governmental services. The need for new sites arises chiefly because the services are expected to require expansion for whatever reason—a growing population, a desire to provide new or upgraded services to an existing population, changing technology, and so on. Since it is likely that such forces tend to cause frequent needs for further services, the related land acquisition tends to constitute an ongoing program with many broadly repetitive operations. The two case studies described in Chapters 7 and 8 are of advance acquisition programs essentially of this sort.

Second, much larger areas can be acquired in advance for community facilities which require extensive tracts of land. Facilities of this sort would be major recreational areas, reservoirs, airports, industrial parks, and the like. Most communities require no more than a few of these very large sites, and the decision to acquire land to fill the new needs is not a routine matter. Such acquisitions may take place no more than two or three times in a decade. Acquisition in advance to meet these needs presents quite a different problem from the frequently recurring advance acquisitions of and for individually smaller scale needs, and it is not likely that it could be carried out in any routine program. The investment is so large that a mistake is politically intolerable. Public debate takes place. In short, each acquisition must be considered in the context of a unique event.

Third, land can be acquired in advance primarily for the purpose of shaping a desired land use pattern, rather than to provide the sites required for production of specific public services. The community acquires land in order to direct its future development, both public and private. To be effective, this requires control over a very substantial quantity of the undeveloped land surrounding an existing urban area. Control does not necessarily have to take the form of outright ownership; there is a wide variety of less comprehensive means, of which zoning and mapping are examples. But insofar as purchase in full fee is the method used, the program is of a completely different magnitude from acquisition of sites for specific public facilities. There are well-known examples of this sort of acquisition in Europe, but few if any in this country. The purpose and methods of these programs are very different from those of the first two types. In many ways, they constitute a different subject. Accordingly, we defer discussion of them until Chapter 9, where we attempt at least an introductory discussion of advance acquisition intended primarily to shape the pattern of urban development. Tangentially, of course, advance acquisition for specific facilities can and often does influence community land use patterns, and this is discussed as we go along.

SOME INSTANCES OF ADVANCE LAND ACQUISITION

Unfortunately, there is very little information concerning advance land acquisition that is readily available. Advance acquisition of land is not a category of the activities of local governments on which any systematic statistical information is ordinarily collected. If it were, a comprehensive inventory would have to include not only the activities of the usual overlays of state, county and city governments, but acquisitions by school districts and other special authorities as well.

There are, however, a few scattered reports of advance land acquisition in connection with particular fields of government service. The examples tend to concern the large unit, nonrepetitive type of acquisition.

In the highway field, for example, land has quite frequently been acqired in advance.[1] For this there are several reasons. For one thing, a relatively high proportion of the total cost of a highway is accounted

for by land. It has been estimated that 31 percent of the cost of the urban portion of the Interstate Highway System will be spent on acquiring the right-of-way.[2] Therefore, anything that cuts down the cost of land acquisition can reduce significantly the total cost of the whole project. A related reason for the emphasis on advance acquistion is the fact that the importance of land acquisition in highway construction has given rise to a group of specialists who deal only with the acquisition of rights-of-way. In the course of their endeavors to make the acquisition of land for highways as efficient as possible, they have naturally turned their attention to the potential advantage of acquiring it in advance.

A good example of the active use of the technique is to be found in California where there is a $30 million revolving fund to finance acquisition of land in advance of highway construction. Once the future right-of-way has been designated the necessary land can be acquired with funds from the revolving account. At the time when the land is actually used for highway construction the revolving account is reimbursed by an amount equal to the original acquisition cost. Between 1952 and 1966 California spent $62,500,000 for such advance land purchases. The Division of Highways estimates that if the same properties were to be acquired now (or at the time they were actually needed) they would cost $380,500,000.[3] The savings are partly due to the fact that rights-of-way have been acquired in a period when land prices were rising. But the bulk of the savings is attributed to the fact that the right-of-way was acquired in time to forestall private development which would have been costly to purchase and demolish.

Ohio has a somewhat different procedure for advance land acquisition for highways. Once the right-of-way has been designated, the necessary land is acquired with funds from three retirement boards (Public Employees, State Teachers, and Public School Employees). Title to the land is held by the retirement boards for up to five years, and when the land is transferred to the State Highway Department for construction, the retirement boards are paid the purchase price plus interest at 5½ percent per year. During the holding period the property is leased by professional realty management agencies under contract with the state. Land acquired for highways in urban areas has generally been held for one to three years before transfer to the Highway Department. No estimates have been made of the savings that have resulted from this program.

The other main field where considerable advance land acquisition has been reported is parks and open spaces. New York City's Central Park, the park system in Cleveland, and the Westchester County park system are widely praised examples of early action to acquire park land, though in each case the acquisitions were reponses to felt current needs as well as provisions for the future. Most of these early acquisitions were sparked by energetic civic leadership, often by a single personality, rather than by institutional analyses of future needs.[4]

More recently, the new Federal Open Space Land Program has generated considerable interest in advance land acquisition for permanent open space. Federal grants are now available to cover up to 50 percent of the cost of acquiring land and developing urban open spaces, and during the first seven years of the program (1962–1968) grants of $195 million were made for the

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1. Some of this work has been reported on in the Highway Research Board's excellent 1957 study, *Acquisition of Land for Future Highway Uses: A Legal Analysis.* (Special Report 27. Washington, National Academy of Sciences, National Research Council, 1957.) This report concentrates on the legal aspects of advance acquisition for highways. Other aspects of advance acquisition for highway use have received attention in the Highway Research Board's yearly bulletin, *Land Aquisition.*
2. *Ibid.*, p. 1.
3. Letter from Rudolf Hess, Chief Right of Way Agent, California Division of Highways.
4. Editors of Fortune, *The Exploding Metropolis,* Garden City, New York, Doubleday & Company, 1958, p. 148.

acquisition of more than 280,000 acres of land. While not all of this represents advance acquisition, the program aims to provide better long range development of urban areas. An extensive report of the work being done in the field of open space acquisition is given in Ann Louise Strong's 1965 study, *Open Space for Urban America.*[5]

These reports on individual fields in which it has been found useful to anticipate the need for land by early purchase are valuable as far as they go. Yet clearly, far more knowledge is necessary. For one thing, in assaying the potential usefulness of a technique, it is important to know the overall extent to which it has been used, rather than simply something about a few of the purposes for which it has been found most useful.

THE RESULTS OF TWO QUESTIONNAIRE SURVEYS

In an effort to provide information with which to fill this gap, for city and county governments, the National League of Cities and the National Association of Counties, early in 1966, conducted a questionnaire survey on advance acquisition of land for public purposes. The results of these inquiries were analyzed by the Institute of Public Administration.

The city questionnaire was mailed to the entire direct membership of the National League of Cities,[6] considered a representative group of American cities in each size category above 50,000 population. Of the 306 questionnaires mailed, 144 (47 percent) were completed and returned. The county questionnaire was mailed to 117 selected counties—those counties with planning directors who were members of the National Association of County Planning Directors. The basis of selection suggests that the sample may cover counties more likely to have advance acquisition programs than would counties without planning directors. Fifty-seven (49 percent) of the counties responded. The questionnaire itself and the tables that summarize the answers are included as an Appendix to this study. The reports suggest some of the dimensions of advance land acquisition among American cities. The county material is too sparse and possibly atypical, and accordingly, it serves only as supplementary information. The salient findings are reviewed below.

Number of Programs

Of the 144 cities that returned questionnaires, 73 (51 percent) spoke of programs of advance acquisition and another 32 (22 percent) reported very occasional acquisitions. Corresponding figures for the counties were 18 (32 percent) and 12 (21 percent).[7]

It would be useful to use this information as a basis for an informed guess concerning the extent to which all American cities have advance land acquisition programs. The first step in constructing the estimate is suggested by the fact that, when an allowance is made for the coverage of the sample for each city size group, there appears to be a marked decline in the frequency of programs as city size declined (Appendix Table C). The allowance takes account of the fact that though coverage for the very large cities was almost complete it was only about two-fifths for the cities between 50,000 and 100,000 population. The coverage for the still smaller cities was too small to serve as a basis for further estimation. Following this general line of reasoning (the argument is spelled out in connection with Tables B & C in the Appendix) we arrive at what can only be termed an informed guess about the incidence of advance acquisition programs in American cities: Perhaps one-third of the cities of over 50,000 population have programs. If the smaller cities were included,

5. Ann Louise Strong, *Open Space for Urban America.* Urban Renewal Admistration, Department of Housing and Urban Development, Washington, D.C., Government Printing Office, 1965.

6. These were all cities that were dues paying members of the NLC, rather than members by virtue of their membership in the various state municipal organizations.

7. Whether or not a city or county had a "program" was indicated primarily by its answer to Question 1—"Is there in your city a program for acquisition of land in advance of intended use?" A "no" answer was taken literally. In a very few cases a "yes" answer was thrown out because the number of cases reported seemed too small to be meaningfully interpreted in terms of a "program."

the figure would of course drop. Concerning counties, little can be said except that programs appear to be uncommon.

Characteristics of Advance Acquisition Programs

Age: The questionnaire indicated that an advance acquisition program is by no means a new development. Seventy percent of the cities reporting programs said they had been in operation for seven years or more; 26 percent for 16 years or more. County programs tend to be younger.

Size: An "advance acquisition" was defined as one intended for use at least three years after purchase. The number of acquisitions is the only available measure of the size of programs and is also a broad indicator of scale, even though individual acquisitions can range from a small lot to a large park. Programs tend to be small. Of all programs, 45 percent reported by cities and 39 percent reported by counties involved no more than 10 acquisitions over the life of the program. The figure should doubtless be larger, since it is swelled by a goodly number of cities whose returned questionnaires did not report the number of acquisitions. Distinctly large-scale programs were reported for 13 percent of the cities. Several cities reported over 100 separate acquisitions (Appendix Table E). Ten cities and 3 counties had each bought over 30 properties in advance of use.

The scale of a program is perhaps more aptly described by the number of acquisitions per year than by the total of all acquisitions made to date. Our calculations indicate that three-fifths of all cities completing the questionnaire report an average of five or fewer acquisitions for each year the program had been in operation, and here again the figure in fact is probably larger by reason of those cities with programs which gave no size data. Only 15 percent of the reporting cities (11 cities) averaged six or more acquisitions each year. Apparently, then, the large majority of programs of advance acquisition are small ones.

Motives and Purposes: The questionnaire presented a checklist of several possible motives for undertaking advance acquisition (Appendix Table G). Avoiding rising land prices was the reason given most often; 81 percent of all reporting cities and 83 percent of the counties checked this as an important factor. To secure the best location for the particular need was a close second, cited by about 77 percent of all cities or counties. The avoidance of demolition cost was mentioned by 29 percent of the cities and 22 percent of the counties. The cities were also asked to indicate which motive was the most important one. The largest number of them, 33 percent, chose "obtaining the best location." Avoidance of price rises in land was the second of the most important reasons.

Respondents were given a checklist of seven purposes for which sites might be acquired in advance (Appendix Table H and Question 4). They were asked to rank the relative importance of the purposes that they checked. On this basis, schools and parks are clearly the most usual of the public purposes for which acquisition of land in advance of need has been used in the cities covered by this survey. Fire stations, and government buildings followed in importance. For counties, parks were clearly the most important, with schools and government buildings next. School sites were deemed of special importance, as evidenced by the assignment of first rank to schools by 31 cities and 7 counties. Also, it is rather interesting to find 8 cities mentioning street widenings as the most important purpose to which land purchased in advance is put.

Operation of Programs: Several questions were included in the survey to elicit information on the administration, operation, and mechanics of the advance land acquisition programs in the reporting cities.

The purchase price of the property and the assessed valuation are, of course, known at the time a piece of property is purchased by a public agency. But if the advisability of buying ahead is to be reviewed, at least one very crucial question concerns whether the value of the property has appreciated. To determine whether it has, an appraisal of market value must be made at the time the particular property is put to its in-

tended use. One-half of the cities with programs reported that they did make appraisals of market value, but it is not clear whether these were made when the property was put to use or at some other time.

As to the cost of holding properties, only slightly more than one-quarter of the cities reported that they determined the carrying costs for holding land for future use. Little can be said about the adequacy of the computations.

Whether advance acquisition was embarrassed by impediments of various sorts was the subject of several questions. The one most frequently mentioned was the lack of sufficient funds; it appeared on one-third of the answers. But this figure doubtless fails to reflect the whole story, since lack of funds may prevent initiation of programs in the first place. The particular kinds of funds that could be tapped for advance purchases did not seem to be restrictive. Potential types of funds that were mentioned included capital fund revenues, unappropriated surpluses, capital reserve funds, special revolving land acquisition funds, and bond issues.

Legal restrictions were reported by only 16 (22 percent) of the cities with acquisition programs. There is little indication of much litigation, possibly owing to the low level of advance acquisition activity.

Other Methods of Reserving Land for Future Use: The two most important ways of reserving land for future use for both cities and counties were (1) through acquiring it by the application of subdivision controls, reported by 74 percent of the cities and 61 percent of the counties, and (2) through easements, listed by 64 percent of the cities and 39 percent of the counties. The use of options, mapping, and various policies for utility extensions also were reported by a significant number (Appendix Table I).

Properties coming into public ownership because of tax delinquency provide, in many instances, another potential reservoir from which sites or parts of sites may be drawn for needed public use. However, only 40 (55 percent) of the reporting cities mentioned practices of reserving such land. In most cases, tax-foreclosed land appears to be handled by agencies other than those regularly involved with advance acquisition.

Summary: The broad story that the survey paints makes four points: some advance land acquisition is not uncommon in cities of 50,000 or more inhabitants—perhaps a third do some work of this sort. But they do very little of it. Forestalling a rise in prices or getting a best site are the major reasons for advance acquisition, and school and park sites the most usual target. The chief restriction if felt to be insufficient funds. Legal difficulties are not considered serious.

This last point invites a more direct approach—the records of the law itself.

LEGAL STATUS

It is essential to determine whether programs of advance acquisition are severely hobbled by legal difficulties. The questionnaires submit one scrap of evidence suggesting that this is not the case. But further evidence is essential.

It would be useful to know in the first place whether it is common to encounter difficulties in connection with the central issue of purchasing land for future rather than immediate use. Second, one would like to know the attributes of advance purchases that start to meet resistance in the courts —"too long" periods of anticipation, "insufficient" specificity of purpose, for example. Finally, there are two specific questions raised by our own studies. Flexibility appears to be of great importance to a successful advance acquisition program. Accordingly, it would be useful to examine the legal record insofar as it concerns two important sources of flexibility—the powers to sell and to change the purposes for which land is to be used.

Legal precedent is evidenced by uncontested acts as well as by constitutions, statistics and judicial rulings. The many actual instances where land has been acquired in advance demonstrate that the law is flexible. The handling of tax delinquent properties provide examples of the two sorts of flexibilities—alteration of intended purpose and the power to sell.[8] The power to sell has been used, though not without some legal restriction, in connection with "excess

condemnation" of rights-of-way and irrigation projects where large parts of the irrigated basin have been acquired along with the lands actually needed for construction purposes. The resale of the unneeded properties after the work is completed provides a potential source of revenue.

For focused evidence concerning the legal status of advance acquisition we look to the common law, the reported decisions of appellate courts, and the constitutional or statutory authority to act, both in acquiring land and in disposing of it. It will be useful to review the legal precendents with special attention to decisions relating to specificity of purpose and the power to resell.[8]

Statutory authority to buy and sell: Local governments usually have statutory power to acquire and dispose of land, either expressly conferred, or implied, as an incident of their general governmental authority. Most special districts and authorities are also given such power where it is necessary to their mission. Where there is doubt as to whether the power exists, but no clear constitutional or state statute prohibition, legislative amendment at the State or local level can remove any doubt.

Judicial support for expanding government activity: The first indication of a liberal philosophy by the courts has been shown, in recent decades, by the very clear trend to uphold expansion of local government into new fields of activity, or into new and different types of activities within traditional fields. This is true with respect to physical development and land use controls, public housing, urban renewal, zoning, welfare, manpower training, anti-poverty programs, and the conduct of private business. In turn this reflects national traditions and the evolution of juridical thinking of the United States Supreme Court in the last quarter century.

Judicial support for advance land acquisition in general: A review of state court decisions indicates that advance land acqui-

8. Arrangements differ substantially in different cities. The situation in New York City provides an interesting example. Transfer of ownership of delinquent properties was facilitated by a proceeding in rem—a proceeding against the property rather than against the owner. The city-owned properties are managed by the Department of Real Estate. Properties are sold at periodic auctions unless there have been specific requests by other city agencies to hold them. Any city department may issue such a request which must then be reviewed and authorized by the Board of Estimate. Though not originally the case, these requests must now be reissued and passed on each year.

9. The few cases cited in the next several pages reflect the general sparsity of the law in this area (and the relatively low level of government activity with respect to advance land acquisition). Our review of case law has covered a number of tangential subjects. For the record, our review has included case law on the *municipal power to annex*, e.g., *State v. Columbia Heights*, 237 Minn. 124, 53 N.W. 2d 831 (1952), the court construing strictly statutory authority of a city to annex territory (held: not broad enough to permit annexation of land in another municipality), and *Town of Forest Acres v. Seigler*, 224 So. Car. 166, 77 S.E. 2d 900 (1953) where the court held that without legislative authorization a municipality cannot extend its limits into organized areas; *need to acquire land*, e.g., *Kings County v. Theilman*, 369 P. 2d 503 (Washington, 1962) in which the court held that a county's condemnation of land to benefit a private developer was so arbitrary and capricious as to be a "constructive fraud," and Re Real Property in Incorporated Village of Hewlett Bay Park, Nassau County, 48 Misc. 2d 833, 265 N.Y.S. 2d 1006 (1965), in which a lower New York appellate court ruled that the condemnation of land for a storage barn was designed to thwart the owner from building a parking lot; *constitutionality of urban renewal statutes*, e.g., *Housing and Redevelopment Authority of City of St. Paul v. Greenman*, 255 Minn. 396 (1959), and *Miller v. City of Tacoma*, 378 Wash. 2d 764 (1963), 96 N.W. 2d 673 (1959); *use of land acquired by dedication*, e.g., *Dunlap v. Tift*, 209 Ga. 201, 71 S.E. 2d 237 (1957), and *Bruker v. Carlisle*, 376 Pa. 330, 102 A. 2d 418 (1954), *Center v. Benton*, 414 Ill. 107, 110 N.E. 2d 223 (1953), *Wishart v. City of Lumberton*, 254 N. Car. 94, 118 S.E. 2d 35 (1961), *Aldrich v. City of New York*, 208 Misc. 93, 145 N.Y.S. 2d 732 (1955), affirmed 2 App. Div. 760, 154 N.Y.S. 2d 427, *Moore v. City of Fairhope*, 277 Ala. 380, 171 So. 2d 86 (1965), *Village of Ossining v. Lakin*, 5 Misc. 2d 1024, 160 N.Y.S. 2d 1012 (1957), and *Martin v. Norfolk Redevelopment and Housing Authority*, 205 Va. 942, 170 S.E. 2d 673, (1965), many of which construe narrowly land dedicated for park purposes (the last cited case appears to differ somewhat); *changes in use of land acquired by eminent domain* (the courts generally becoming more liberal), e.g., *Newport v. Los Angeles*, 184 Calif. App. 2d 229, 7 Calif. Rpto. 497 (1960) in which a California appellate court upheld use of land originally condemned for a railroad to be leased for oil wells (the city to obtain royalties), *Anchiga v. Housing Authority of Los Angeles*, 149 Calif. App. 2d 657, 324 P. 2d 973 (1958), and *Daly v. Kansas City*, 317 S.W. 2d 360 (Missouri 1958) in which land condemned for a park was allowed to be used for Veterans' housing; finally, *excess condemnation*, e.g., *Gray v. Quachita Creek Watershed District*, 351 S.W. 2d 142 (Ark. 1961) in which the court held that the watershed district had been given great discretion as to the location and area to be taken, and the burden of proof of excess taking was on the appellant.

sition actions and instances of selling of land follow this trend.[10] There are, to be sure, few reported decisions, but the general rule is to uphold governmental action to acquire land, as long as a public purpose is established and there is no evidence of fraud. Intent to use, even if immediate use is not contemplated, is allowed. And unless the acquisition is subject to restraints on alienability, or some element of fraud is involved, the decisions support governmental power to dispose of land no longer needed. Again, while the decisions have been few, it seems reasonably clear that governments have the power to change their minds, so that land acquired for one purpose can be used for some other purpose or disposed of. And there are few constraints on use or sale of tax delinquent land which becomes the property of the government.

Degree of futurity: Courts have and may object to a proposed acquisition on the grounds that the intended use is too remote; otherwise, they are generally inclined to uphold the action. Thus, in 1952, the Supreme Court of Arkansas held that the State Highway Commission may take a sufficiently wide right-of-way to allow for eventual expansion of the highway.[11] A Florida court has held that it is the duty of public officials to look to and plan for the future.[12] The acquisition of land for an airport, which, after seven years since the acquisition, still had no airport construction, was sustained. But where condemnation of a school site involved construction at least 30 years hence, the Michigan Supreme Court refused to go along.[13] One wonders whether the Court would have been impressed if the action had been demonstrated to be consonant with a long range, comprehensive development plan.

Several cases have held that the need for a new highway must be demonstrated by definite construction plans as a prerequisite to condemnation of land. Sometimes at least definite plans or even legislative appropriation of funds are required. But the trend is in the other direction.[14] The latest trend has been to grant greater leeway to the local government in deciding that lands will be needed for future highway purposes and to uphold land acquisition through the power of condemnation. Thus, in *State Road Department of Florida v. Southland, Inc.*, 117 So. 2d 512 (Fla. 1960), the State Road Department sought to acquire a right-of-way for a limited access interstate highway before funds had been allocated for construction purposes and before specifications had been completed and adopted, and before the department was in a position to state with certainty when construction would be commenced. It was held that condemnation in this instance was not a gross abuse of discretion and that no lack of public purpose or use was shown. The test to be applied was one of bad faith, fraud, or gross abuse of discretion.

Specificity of public purpose: While it is difficult to separate cases dealing with futurity from those dealing with the issue of whether a public purpose exists for the land acquisition, the courts in general are liberal. Thus, valid condemnation was upheld where a state legislature determined to acquire additional land for the state in a civic center in which the capitol site was to be established, without specifying whether the land was to be used for public buildings, parking areas, or other public uses. There was no evidence of fraud, bad faith, or abuse of discretion and the court was able to find[15] a distinction between that case and the cases of *State v. 0.62033 Acres of Land, Board of Education v. Baczewski,* and *State v. City of Euclid,* noted above, as involving situations where the need was only probable and for some remote, indefinite or speculative future time.

10. For valuable discussion and evidence on the general subject see the 1957 publication previously cited, *Acquisition of Land for Future Highway Uses; A Legal Analysis.*

11. *Woollard v. State Highway Commission,* 220 Ark. 731, 249 S.W. 2d 564 (1952).

12. *Carlor Co. v. City of Miami,* 62 So. 2d 987 (Florida 1953), *cert. denied,* 346 U.S. 821, 98 L.Ed. 347 (1953).

13. *Board of Education v. Baczewski,* 340 Mich. 265, 65 N.W. 2d 810 (Mich. 1954).

14. *State v.* 0.62033 *Acres of Land,* 112 A. 2d 857 (Del. 1955), *State v. City of Euclid,* 130 N.E. 2d 336 (Ohio 1955).

15. *State v. Chang,* 378 P. 2d 882 (Hawaii 1963).

Sale of land found not to be needed: Issues in the disposition of land if the expected need for it does not materialize differ depending on what interests are to be covered, how the land was originally acquired (whether by dedication, purchase, condemnation, or tax delinquency) and what restrictions were placed on the conveyance of the interests in land at the time of acquisition.

Local governments must possess authority to sell or dispose of land no longer needed. As noted previously, authority can be expressed in statute or constitution or reasonably inferred. Once this authority is possessed, the capability of the city or county to dispose of property it lawfully owns is quite broad. However, procedural restrictions in the enabling statute, e.g., requiring sale to the highest bidder, sufficient notice to all, equal treatment, must of course be observed.[16]

Although there is a paucity of reported discussions by the courts, they have generally not attempted to construe narrowly statutes authorizing or implying capacity to dispose of land. Thus, where a city-owned golf course was under a Federal Court decree not to discriminate, the city could nonetheless lawfully sell the golf course, ". . . pursuant to its legislative authority so to do, when in its judgment such facility was no longer needed for the use of its citizens since this is a local administrative question." The reasons for selling the golf course were set forth in the Resolution of the City Commission and had nothing to do with integration and were, in the Court's view, ample justification for the sale. The fact that some members of the Commission may possibly have entertained a thought that the sale of the golf course would prevent its integration is immaterial.[17]

Several cases allowing disposition of land concern properties taken by condemnation but there is no reason to suppose that this evidence would not apply at least with equal force to land originally purchased in the open market. Once land has been taken by eminent domain, it becomes the property of the local government in fee simple, and may be treated as any other city (or county) property, for use, for conveyance, or for any other purpose. Local government's right to shift the use of the acquired land from one public purpose to another is clear. Government has the right to alienate freely any excess property condemned for a public purpose. It also has the right to sell to private persons, and at a profit, any land originally taken for a public purpose, and which is no longer necessary. The only limits placed on this municipal right are that there must have been no fraud or gross abuse in the original taking, and that planned future use for public purposes was the true reason for the original taking.[18]

The essence of the entire issue thus turns on the original condemnation, and if this was in good faith, and within powers authorized by state legislature or constitution to the local government, all subsequent treatment of the land which is allowed to the local government under its general rights as to its public or proprietary property is also allowed to property acquired by the condemnation method under the doctrine of eminent domain.[19]

A partial exception occurs where properties are acquired by dedication. It is in general more difficult to dispose of land dedicated for a public purpose, such as for a

16. *Lieberman v. Neptune Township*, 50 N.J.S. 192, 141 A. 2d 553 (1958).

17. *Griffis v. City of Ft. Lauderdale*, 104 So. 2d 33, 34 (Florida 1958).

18. Thus in *Beistline v. City of San Diego*, 256 F. 2d 421 (9th Cir. 1958), the court held that where a vendor had voluntarily sold land to the City of San Diego (the city had filed suit for condemnation of his property which was to be used for a municipal airport), and nine years later the city sold the realty to a private corporation at a considerable profit, the mere fact of the city's changing its corporate mind did not establish a taking for private use or an extrinsic fraud amenable to suit as a violation of due process in a Federal Court. A similar decision in Pennsylvania held that where land has been condemned in good faith for an airport, and then passed on to a Redevelopment Authority, which sold it at a profit to private individuals for industrial development, there had been no abuse in the original condemnation. (*Starkey v. City of Philadelphia*, 397 Pa. 512, 156 A. 2d 101 (1959).

19. It should be noted that some jurisdictions, in exercise of the power of eminent domain, use a technique called mapping. This is a procedure akin to, but not identical with, condemnation and it is likely that the same legal concepts would apply in cases under mapping.

park, than it is to dispose of land acquired by condemnation or purchase. Without charter or statutory authority, municipal property dedicated or in trust for public use cannot be sold. But property which has outlived its usefulness or has become inadequate for its public purpose may be sold by the municipality without specific legislative authority, under the general statutory charter power to hold and convey property. There may be more stringent requirements, e.g., approval of 70 percent of adjacent property owners, before property acquired through dedication may be disposed of.[20]

Summary: The limited use of advance land acquisition by cities and counties does not appear to be primarily due to legal constraints. This does not mean that legal problems do not exist. Rather most courts are likely to permit advance land acquisition and the sale or use for some other purpose of land acquired on the basis of expectations that failed to materialize.

20. *City of New Orleans v. Louisiana Society for the Prevention of Cruelty to Animals*, 299 La. 277, 85 So. 2d 503 (Louisiana 1956). One interesting issue has been the sale of land received in tax lien foreclosure, and never dedicated, as was the land in the previously-cited case of *Village of Ossining v. Lakin.* It has been held in one instance, that where such land, used temporarily as a refuse dump, was later sold, provisions of the city charter requiring specific steps by the Council of the City in selling "city real estate" did not have to be complied with. The sale was valid under the earlier provisions of a special ordinance for sale of tax-foreclosed lands, as there was insufficient proof that the city council had clearly assigned the land for public use so as to make it "city real estate." (*Maxwell v. Kristensen*, 15 Misc. 2d 875, 183 N.Y.S. 2d 245 (1959), *affirmed* 9 App. Div. 2d 919, 195 N.Y.S. 2d 607, *appeal denied*, 199 N.Y.S. 2d 439, 10 App. Div. 2d 711.)

Chapter 3

COST-BENEFIT ANALYSIS

Sensible decision about advance acquisition of land, as for any other government undertaking, requires a deliberate judgment in which the advantages of taking the action are weighed against its costs or other disadvantages; when advantages sufficiently outweigh the disadvantages, the action is justified. Needless to say, deliberate consideration of this sort is only one aspect of many government decisions or of the administrative situations of which the decisions are a part. However, it is an aspect worth encouraging and improving. How then can one assemble and weigh the advantages and disadvantages of acquiring land in advance of expected need?

The rest of this monograph attempts to find an answer to the question. This chapter presents first some broad methodological suggestions, and then proceeds to a brief presentation of the bare bones of the analytic frmework of cost-benefit analysis applied to advance acquisition of land.

COST-BENEFIT ANALYSIS AND THE ONGOING ADMINISTRATIVE PROCESS

Framing the question is itself a first step and an important one in framing an answer. It is easy to overlook the highly significant contribution to deliberative government policy that is a function of what *questions* are asked. Advance acquisition of

land is a case in point. The day's urgent needs often entirely blot out awareness of the possibility of potential advantage from acquiring sites for, say, schools in advance. A still deeper invisibility has often obliterated the thought that there may be great advantage to land acquisition policies directed toward furthering orderly urban expansion.

When once the broad question has somehow swung into focus, the next step involves framing, however tentatively, some specific alternatives. At this point, deliberative processes begin in earnest. At least, they do insofar as the final decision is itself to be deliberative. What sections of the city are likely to experience a rise in school-going population? Can the guess be made with sufficient assurance to warrant the consideration of acquiring school sites in advance? What candidate sites are worth considering?

The candidates must then be examined and their advantages and disadvantages evaluated. The process may go through several rounds in which alternatives are weeded out or changed.

A convenient framework for evaluation is provided by cost-benefit analysis, providing the costs and benefits are broadly conceived to include values of all relevant sorts—economic and noneconomic, measurable as well as intangible.

There is nothing new about this sort of analysis. Of necessity, any effort to make a rational judgment involves a balancing of the advantages and disadvantages of the proposed and alternative actions. The attention in recent years to "cost-benefit analysis" represents a difference in the explicitness and formal characteristics (particularly the quantitative emphasis) of evaluative procedures. However, though the quantitative measures must be pushed as far as possible, it is essential to accord full significance to the hard-to-measure or intangible aspects which are in fact advantages or disadvantages associated with advance purchase.

Finally, the character of the benefits and costs and the assurance with which they can be foretold determines how much of the final outcome should be allowed to hinge irreversibly on the decision, and how much should be left contingent on further and later decisions, or subject to change at later times. We find, for example, that under some conditions it is important to provide the opportunity to sell land when, as is sometimes inevitable, guesses on which the purchase was originally predicated turn out to be wrong.

Clearly, then, cost-benefit analysis should be thought of as a technique intended to assist in formulating public policy by helping to design as well as to evaluate alternative courses of action directed toward identified goals. Clearly also, even when conceived of in this way, the evaluations are only one stage of an on-going administrative process.

A cost-benefit analysis requires identification of the advantages and disadvantages of one course of action over those of another. Needless to say, a complete list of costs and benefits is impossible to achieve and it is necessary to focus on the more likely and more important ones.

Evaluation ideally implies that both costs and benefits be at least roughly measured and compared. But the ideal can seldom be achieved since usually many of the benefits, and typically at least some of the costs are not subject to satisfactory measurement. Nevertheless, cost-benefit analysis can sharpen alternatives by first comparing measurable costs with measurable benefits (to arrive at a net measured cost or benefit) and then concentrating on putting such intangible costs and benefits as are present in perspective with each other and with the measurable costs and benefits.[1]

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1. A test for the usefulness of cost-benefit analysis has been suggested by Ruth P. Mack and Sumner Myers. "Outdoor Recreation," in *Measuring Benefits of Government Investments*, Robert Dorfman, Ed., Washington, D.C., Brookings Institution, 1965, p. 76. By their criteria, a cost-benefit measure is useful in proportion to:

(1) The percent of total benefit and cost that it adequately calibrates;

(2) Its capacity to uncover, focus and steady the aspects of total benefit and cost that it fails to calibrate;

(3) Its general acceptability;

(4) Its power to improve administrative or legislative action because of a capacity to focus on well considered notions of the public weal.

The cost-benefit criterion for undertaking a course of action is that the benefits must be greater than the costs and the net benefit must be greater than that of alternative uses of the resources. The analytical techniques are similar to those used by business firms in their investment decisions; however, where a business firm calculates its own private costs and receipts in evaluating the profitability of an investment, a governmental body must consider a broader range of social costs and benefits many of which have no market price. Of what do they consist?

SOME GENERAL CHARACTERISTICS OF COSTS AND BENEFITS

Benefits may take the form of dollar receipts, as when land is sold or rented. They may take the form of dollar costs forestalled, as when the early purchase of land eliminates the need to pay more for it later. They can consist of improved efficiency of land as a factor of production, as when improved quality increases qualitatively or quantitatively the output that is turned out. They can consist of intangible values which may be subject to, at best, only the vaguest quantification; an example is the boost to long-term planning procedures that a successful advance acquisition program can generate. They may concern economic advantage or other sorts of values such as beauty or psychological well-being.

Costs cover the analogous range, and there is no difficulty, with one exception, in naming the cost-counterpart of each type of benefit. The exception is the benefit of a cost forestalled; the cost-counterpart is a benefit foregone, commonly called an "opportunity cost."

The notion of opportunity cost derives from the notion of scarcity. Since resources are typically limited, if they are used to produce one set of goods they cannot be used to produce some other which is almost but not quite as desirable. The second set of goods must be given up if the first set is to be enjoyed. Thus the second set is the opportunity cost of the choice to commit the resource in question to the production of the first set. For example, if an area is purchased as a park it cannot be used as the site for high-rise apartments. The stream of benefits derived from the location of apartments on that particular ground rather than somewhere else is the opportunity cost of the stream of benefits derived from the presence of the green area and the recreation. Likewise the capital invested in land has an opportunity cost, and the determination of its character and size raises a number of important and somewhat complicated questions. They are discussed in Chapter 5.

A second set of questions involved in defining benefits or costs concerns to whom they accrue. For a business firm the answer is at least relatively clear, since the reference point is the particular business enterprise. But governments must somehow act on behalf of the public. In connection with advance land acquisition we face the dilemma that land is highly localized geographically and so likewise are the benefits and costs associated with the use of land. Governments also are geographically localized, but the principles of the localization may differ from those applying to land. As a result, both benefits and costs associated with advance land acquisition often will not be contained within the local government area making the decisions, but spill over to those nearby. Thus a park in one area will provide recreation also for a neighboring town. For the two areas together it may be worth undertaking the land purchase, but for either area alone the costs would outweigh the advantages. The problem has many variants involving the familiar problems of spill-over effects and externalities. These externalities provide one of the reasons why the Federal Government has started to interest itself in facilitating advance land acquisition for local governments.

However, in order to construct a cost-benefit analysis it is necessary to settle on a frame of reference for the decision. The burden of the previous paragraph is that a given governmental investment alternative may have several appropriate frames of reference. The solution of the difficulty must be to use these frames one at a time. Thus, in circumstances where costs and benefits differ depending on the particular governmental unit for which the advisability of

advance land acquisition is being evaluated, different sets of accounts may be required, each set including costs and benefits as perceived by the particular governmental unit. For an entire economy, it is desirable to include all relevant values and costs regardless of local incidence.

Since land acquisition in urban areas is customarily done by local governments, the focus of our analysis is *costs and benefits as perceived by the local decision makers.* A particular corollary of this focus concerns the appropriate interest rate to use as the annual cost of capital; we use the local government borrowing rate. A different interest rate would apply if the frame of reference were the Federal Government or the total economy. Chapter 5 discusses this choice and its conceptual consequences in some detail. For the moment it will be helpful to accept it uncritically at least for illustrative purposes. In any event, the net advantage or disadvantage as calculated for the local agent needs eventually to be reviewed in the broader context of the public interest at large.

COST-BENEFIT ANALYSIS APPLIED TO ADVANCE LAND ACQUISITION

The analysis starts with the assumption that the production of some government service—outdoor recreation, education, fire control—will in the future justify the acquisition on land. The only question is whether the land should be acquired in advance of the "target date"—the time when the land would ordinarily have to be bought in order to produce the service at the proper time. Note that the worthwhileness of the intended future use is not part of the question here.[2] Rather, given that future public need for land is anticipated, *only the costs and benefits associated with the "advanceness" of the land acquisition are evaluated.*

Alternatives

Given the expectation that a particular piece of land will be required for a particular public purpose, say, seven years hence, there are several alternative ways of providing it. The first four involve outright purchase. The fifth and sixth, more limited commitments. As is indicated at the close of the chapter these "alternatives" can also be used in a wide variety of combinations:

1. Buy when actually needed, that is, at "target date" as defined above.
2. Buy now to hold until target date.
3. Buy at some time between now and target date to hold until target date.
4. Buy now (or later) but be prepared to sell if forecasts on which acquisition was predicated turn out to be wrong. This alternative is a double one, since it provides a variant of 2 and 3.
5. Acquire rights short of purchase in fee simple. Examples are: options, easements lease, or subdivision control requiring land dedication.
6. Inhibit or prohibit disadvantageous use of designated property by a variety of techniques such as zoning, mapping, or controlling utility extensions.

Most of this monograph concentrates on the alternatives 1 through 4, though in Chapter 9 we raise problems that may be solved by considering reservation of land by means other than outright purchase (alternatives 5 and 6). Alternatives 1 and 2 present the most straightforward choice. Alternative 3 simply recreates the decision situation at successive dates. Alternative 4, in conjunction with either 2 or 3, introduces the possibility of correcting a mistake. For the immediate purpose of describing the skeleton of cost-benefit analysis, we shall concentrate on alternatives 1 and 2 (including 2 and 4 combined)—buying at target date versus buying now.

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2. A number of important questions are ruled out for the present, though we touch on them in subsequent chapters:
   a. That a government service of a particular level is justified;
   b. That the input mix requirements necessitate acquisition of additional land (as opposed to other possible inputs such as floor space in multi-story buildings);
   c. That the cost of the land input is consistent with the overall cost of the service level deemed to be justified (presumably there are some input cost levels at which it would not be justified);
   d. That the service level might be justified within the land-input cost limits allowed by advance acquisition but not justified (as of the present moment) under some assumptions as to the cost of land at some future date.

The two dates "now" and "target date" are a little tricky. "Buying at target date" in practice means sometime before physical possession of the land is required and really refers to the latest time when negotiations need to be started if the availability goal is to be achieved. "Buying now" involves starting negotiations immediately, though costs and benefits will begin to accrue somewhat later.

Choice Under Certainty

To consider the relative advantage of buying now or waiting until target date, it is necessary to forecast events over the interval, and forecasts are inevitably uncertain. There is uncertainty about future use of the land, future land prices, future private development, and the like. This uncertainty raises analytic difficulties which will be shelved for the moment; we return to them later in the chapter.

Assuming that knowledge is certain, consider this abbreviated list of possible benefits from advance acquisition:

1. Appreciation in value of the land acquired.
2. Return on temporary use of the land during the waiting period.
3. Beneficial effects on other private or public land use accruing from the public advance acquisition.

A similar short list of costs would be:

1. Cost to the city of committing capital.
2. Foregone taxes on land removed from private ownership.
3. Cost of managing land held for future use.

As an example of how to evaluate these costs and benefits in a particular situation, assume the following hypothetical facts are surely known:

Data for Benefits:

1. A particular piece of land has been identified in a city's capital improvement program as necessary for a future school site. The school should be ready for use ten years hence and therefore negotiations to acquire the site must start at the latest in seven years (target date). The site is now available at the price of $100,000. The estimated value of the same piece of land seven years from now is $150,000 (i.e., land value appreciation at a rate of 6 percent per year).
2. If purchased by the city, the site can be leased as a parking lot to a private operator in the seven-year interim for rent of $1,000 per year.
3. Advance selection of the school site is expected to encourage private housing development along the lines set for the area by the city's master plan.

Data for Costs:

1. The city can borrow funds for advance acquisition at the current borrowing rate of 4 percent per year.
2. The real estate tax on land is 2 percent of market value. Thus, if the land is accurately reassessed each year in accordance with its market value, which is rising at a rate of 6 percent a year (see item 1), the taxes foregone would be a stream of payments also rising at 6 percent per year—from $2,000 ($100,000 x 2 percent) in the first year to $3,000 ($150,000 x 2 percent) in the seventh year.
3. The cost of managing the property, if acquired in advance, is $100 per year.

Once these data have been estimated, how are the costs and benefits to be compared?

Comparison of Costs and Benefits:

For costs and benefits measurable in dollars the appropriate comparisons are not between simple sums of all benefits and costs regardless of when they occur. Accordingly a dollar payable seven years from now is worth less than one presently at hand, since it can be put to use over the interval; analogously, benefits are worth more now than later.

This intertemporal aspect of comparing costs and benefits prescribes that all calculations be converted to apply to the same date. The best date to use is the present. Accordingly, all costs and benefits applying to future dates are discounted at an appropriate interest rate to find the equivalent

present value. We shall for the time being take the local borrowing rate as the appropriate interest cost. The discounting procedure is straightforward. For example, $1.00 invested at 4 percent interest becomes $1.04 ($1.00 x 1.04) after one year. Therefore, $1.00 payable one year from today is worth $.96 ($1.00 divided by 1.04) today. Similarly, at the end of seven years, one dollar today becomes $1.32 ($1.00 x $(1.04)^7$) and therefore one dollar payable at the end of seven years is worth $.76 ($1.00/$(1.04)^7$) today, or more generally, $1/(1+i)^n$.

Compare, now, the monetary costs and benefits of the proposed advance site acquisition.

Benefits:[3]

1. The site would cost $50,000 more seven years hence than it costs now. The present value of the benefit of forestalling the price rise is:

$$\frac{\$50,000}{(1.04)^7} = \$38,000.$$

The formula for the present value of a future sum, X, as applied in a present value table, is

$$\frac{X}{(1+i)^n}.$$

2. An annual rental of $1,000 for seven years. The present value of this stream of income is:

$$\frac{\$1,000}{(1.04)} + \frac{\$1,000}{(1.04)^2} + \cdots + \frac{\$1,000}{(1.04)^7} = \$6,000.$$

This is given by the formula for the present value of an annuity, A,

$$\frac{(1-(1+r)^{-n})}{r} A.$$

The sum of 1 and 2 is $44,000.

3. The advantage of fostering better private housing development. One aspect of the benefit bears, perhaps, a rough relationship to the additional real estate tax that would accrue as a result of the better development of the area which the projected school site might stimulate. Other aspects may be present but still more difficult to measure.

Costs:

1. Present value of a seven-year stream of interest at 4 percent on the initial investment of $100,000 is:

$$\frac{(1-(1.04)^{-7})}{.04} \$4,000 = \$24,000.$$

2. A tax loss whose present value is:

$$\frac{\$2,000}{(1.04)} + \frac{\$2,120}{(1.04)^2} + \cdots + \frac{\$3,008}{(1.04)^7} = \$15,100$$

It is assumed for the moment that as the land value appreciates at a rate of 6 percent per year, the tax assessment base also appreciates at a rate of 6 percent a year and the tax rate is 2 percent on full value.[4]

3. A management cost of $100 per year. The present value of this stream of costs for seven years is $600.

The sum of 1, 2 and 3 is $39,700. The net measured benefit is $44,000 minus $39,700, or $4,300. There is only one intangible benefit and no intangible costs.

The advance acquisition appears to have a small net benefit in terms of the dollar-measurable estimates. In addition, the intangible factor also indicates an advantage. Accordingly, the decision criterion that benefits be greater than costs is easily met and the site should be acquired in advance. Of course in this simple example we consider no other costs and benefits.

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3. Calculations assume annual compounding figures rounded to hundreds.

4. The amounts of $2,000, $2,120 . . . $3,008 represent compound growth rates as given in compound interest tables. The present value is calculated for each amount for the proper number of discount periods (years) as indicated by the powers of the discount rates. Thus, at a 4 percent discount rate, the present value of $1.00 due at the end of one year is $.9615, and of $2,000 is $2,000 times 0.9615, or $1,923. The present value of $1.00 due at the end of two years is $.9248, and of $2,120 is $2,120 times 0.9248, or $1,961, and so on. The series for seven years sums to $15,118.

If the expected appreciation in value of the site had been less, the dollar-measured benefits of advance acquisition might have been less than the measured costs, and advance acquisition would then result in a net dollar cost. In that case, the measurable cost would have to be weighed against the intangible benefit to arrive at a decision. However, by making explicit in dollar terms at least a part of the benefits and costs, it is possible to show the minimum dollar value that must be attached to the intangible benefit before the advance acquisition would be worthwhile.

This example has assumed, of course, that there are no other relevant costs or benefits. Also, it assumed that there is no limit on the amount of funds that can be obtained at the 4 percent interest rate; where this is not the case, the criterion for acceptability becomes somewhat more complicated. Both simplifications are removed in subsequent chapters.

The example has made the further assumption that forecasts are all perfectly certain. It is necessary to think for a moment how the analysis must change when this altogether artificial assumption is put aside.

THE IMPACT OF UNCERTAINTY

A central fact about any effort at evaluating future occurrences is that outcomes must be forecast, and forecasts are, like the world to which they apply, almost always uncertain. A decision either to buy ahead or to wait (and therefore not to buy ahead) implies a guess about the uncertain occurrences which will in fact determine the costs and benefits such as those just discussed.

In advance land acquisition, there tend to be two chief foci of uncertainty: (1) the pattern of future land values, (2) the pattern of future land requirements.

Land values, needless to say, can never be predicted with certainty. At best, one might say something of this sort: today a given plot of land could be bought for $100,000; in five years it seems most unlikely that the parcel could be purchased for less, and the price might double, and there is an odd chance that it would triple; the most likely value is about $150,000. These judgments, in effect, substitute a range of values, each having some specified likelihood of occurence, for the single value of the previous example. Instead of the sure figure of $150,000, the judgment might be—$100,000 (probability .1), $125,000 (probability .2), $150,000 (probability .4), $200,000 (probability .2), and $300,000 (probability .1). If the one in ten chance of $100,000 were to prevail, then its present value would be $76,000 and the operation would present a loss. Even if the figure were $125,000, for which the chances of not being exceeded are three out of ten, the present value of $94,000 would still be less than the capital outlay of $100,000. Other dollar benefits are not enough to outweigh the cost. Consequently, unless the intangible benefit of neighborhood improvement were substantial, there would be a 3 out of 10 chance that the project would fail to pay off. There is, on the other hand, a 7 out of 10 chance that it would pay off, and 3 out of 10 that it would do so quite handsomely.

Most efforts to foretell future developments present a range of outcomes of this sort, not a single figure in which confidence can be placed. How can these ranges, which express inherent uncertainty of prediction, form the basis of sensible action?

The answer must distinguish between projects that must be treated singly and those that should be treated as a group. It is also necessary to note ways in which the impact of uncertainty can be muted.

Large-Number versus Small-Number Decision Problems

The viability of a program of advance acquisition may frequently be tallied in terms of an overall result for a considerable number of acquisitions. This tends to apply when the individual purchases are relatively small, for then the outcome must be adequate for the *group* as a whole, not necessarily for each individual venture.

Say, for example, that the municipality whose school requirements tend to grow at the rate of about ten school buildings per year wanted to buy sites in advance when it seemed advantageous to do so. Expectations for each site would, in all probability, be represented by a range of the sort just discussed, and some of the points in the range would be judged more probable than others. For each site the range could be summarized in a single figure—*an average of all possible outcomes weighted by their probability of occurrence, the Expected Value.*[5] Of course, actual benefits, project by project, would seldom turn out to be the Expected Value. For some projects a result toward the lower part of the range might turn up; for others one of the better possibilities would materialize. But if each decision were based on the Expected Value and the estimates were unbiased, the aggregate operation of the program for, say, ten years, would tend to approximate the sum of the Expected Values.[6]

Situations in which a "successful program" consists of the aggregate result of a large number of relatively small purchases are not at all uncommon. The two case studies described in Chapters 7 and 8 are examples. One deals with school sites, the other with purchases of land for a variety of municipal purposes—public buildings, fire stations, street rights-of-way.

But sometimes very large areas of land are required: a good-sized park or a highway site. Here the expenditures are so large and infrequent that success or failure of advance acquisition depends upon the outcome of a small number of cases, indeed, typically one.

In a case of this sort it is essential to make each element of the cost-benefit evaluation in terms of a range of possible values. Some costs or benefits will be relatively certain; interest and carrying costs are often examples. Others may even allude to a 3-point estimate—"most probable result," "what one stands to lose," and "what one stands to gain." However, one way or another, it is essential to consider the range of results that seem probable enough to take seriously. Display of the range (and when possible of their relative probabilities for each major item of costs and benefits) is itself conducive to careful analysis. Armed with this sort of information, the decision agent must feel able to survive the worst of the results sufficiently probable to take seriously; he must be in a failsafe position. The most likely result, on the other hand, must be clearly advantageous.

We have drawn a dichotomous distinction concerning, on one hand, the proper way to structure a grouped decision for which average results are pertinent, and, on the other hand, the small-number situation, typically a single decision, for which each particular venture must stand or fall on its own merits. Of course, the extremes are prototypes and many situations have elements of both.

Moreover, administrative conditions can shift situations from one class to the other. For whether large-number or small-number procedures are relevant depends on the breadth of the jurisdiction and the length of life of the program, or perhaps even of the decision agent's tenure of office.

A particular venture for a small town would for the state as a whole become one of a group, subject to averaging procedures. A new venture in advance acquisition might have to consider and account for each item separately, whereas an ongoing department in a well entrenched government structure might be in a position to rest on the average results over a number of years.

The Uncertainty Discount

The impact of uncertainty, particularly in small-number cases, tends to penalize actions the result of which are uncertain relative to those that are sure. This is sometimes referred to as "risk-aversion." The notion of "failsafe" implies that adverse possibilities are given more weight in a final decision than are the corresponding advantageous possibilities. ("Corresponding" in this sense means as much above as

5. Whenever the phrase Expected Value is used in this technical sense we capitalize the first letters.
6. As will be indicated later, this statement is strictly true only when land can be freely disposed of.

below the weighted-average result.) This asymmetry may well reflect a tendency for political decision makers (as often, though to a lesser extent, for business executives) to be more severely penalized for mistakes of commission than of omission, or to be criticized for losses more than praised for gains.

The tendency for uncertainty to penalize advance acquisition is also likely to be associated with the passage of time. A reward ten years hence is ordinarily susceptible to more unpredictable occurrences than is one that accrues in a year. This time-linked discount for uncertainty is superimposed on the time discount associated with the opportunity cost of committed resources as measured by the interest rate on high-grade bonds. Often the two discounts are lumped together. But we prefer to keep them separate, since the impact of uncertainty can be very different for different acquisitions, all of which can be financed at the same borrowing rate.

Softening the Impact of Uncertainty

The impact of uncertainty in either large- or small-number situations can be softened in a number of ways. A few of these are worth mentioning here. Note that the methods often involve resorting to techniques, singly or in combination, which were listed as decision alternatives on page 26.

1. In advance acquisition, as in so many potential services of government, there is a plethora of useful things to do, relative to the means available to do them. At least for the time being, advantage is often so great that a venture is worthwhile even if the worst outcome worth considering were to obtain.

2. If there is no clear present advantage in advance acquisition, the decision can be reexamined at a later date when circumstances may have changed or clarified. (Alternative 3 on page 26.)

3. An administrative organization that is capable of selling land as well as of buying can in effect often hedge the commitment when forecasts turn out to be seriously incorrect. Sale can correct for an erroneous forecast about what is needed. It can sometimes, in ways that are discussed later, correct for a wrong guess about future prices (alternative 4).

4. Preserving land by methods other than outright purchase (alternative 5) operates to avoid paying all of the holding costs associated with purchase in full fee. By limiting the costs (which tend to be relatively sure) potential net losses are reduced.

5. Finally, events that must be forecast are often subject to a degree of guidance; they do not need to be left entirely to the mercy of outside happenings. For example, it may be possible to influence land-use development patterns by various planning and control devices (alternative 6). The case studies illustrate the impact of city planning, zoning, and public utility and highway extension.

6. Changes in administrative arrangements can, as mentioned a moment ago, shift decisions from a small-number to a large-number situation. Even shared financial responsibility by wider governmental jurisdiction can move in this direction.

These considerations indicate that systematic cost-benefit analysis which uncovers, analyzes and endeavors to quantify the advantages and disadvantages of an action is a useful aid to decision-making. Because of the intrinsic character of some benefits and even of costs, their quantification is often no more than a rough hefting of relative importance. Because of various uncertainties the size of other elements may remain hazy. However, cost-benefit analysis should force uncertainties out into the open where they can be dealt with explicitly, both by policy advisors and policy makers.

PLAN OF THE NEXT THREE CHAPTERS

The general character of the evaluation procedure that we plan to use has been outlined. It consists of ferreting out the potential advantages and disadvantages of acquiring property in advance of need and evaluating the relative magnitudes of

these costs and benefits in the light of their inherent uncertainties. The procedure has been illustrated here. It must now be fully explored.

We turn first to the question of potential benefits. Their character is investigated. For each we consider the problem of converting values into a form that facilitates adding benefits together. In Chapter 5 the same type of investigation of costs is undertaken.

These formulations make abundantly clear that in most determinations of advantage in advance acquisition a major problem must always be that of forecasting land prices and the availability of "best sites." Accordingly, both the literature on the subject and some analytic problems are reviewed in Chapter 6.

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Chapter 4

BENEFITS

Though there are a number of temporary and supplementary advantages that may reward the advance purchase of land, there are two major groups of advantages.

First, there are the benefits associated with large scale, long range advance acquisition undertaken primarily for the purpose of controlling the pattern of land uses, both public and private. These benefits can be very great indeed, even after some possible disadvantage to private interests has been netted out. However, analysis of this large scale advance acquisition is beyond the scope of this report, and we deal only briefly with this set of benefits in Chapter 9. The reasons have been previously explained.

Second, there are the benefits associated with advance acquisition of the sites for future public facilities. Primarily, these benefits result from the capacity of advance acquisition to lower the cost of land as an input in the production of government services. The anatomy of this type of benefit is analyzed in the pages that follow.

In addition, there can be a number of supplementary benefits, including complementary relationships with other deliberative governmental procedures such as planning, economical provision of public utilities and transportation. There is also

the benefit (in a sense, a deduction from carrying costs) of temporary earnings on land. These are considered in the second half of the chapter.

In connection with each type of benefit it is usually necessary to think about at least two sorts of questions. The first concerns how to quantify a benefit in terms that can, so far as possible, be added to other benefits and from which costs can be subtracted. Dollars are of course the most versatile numeraire and it is useful to try to apply a dollar measure—whether relatively precise or quite vague—as far as feasible. However, benefits that elude quantification in dollar terms should not be lost sight of for this reason.

The second sort of question is perhaps a stage in the pursuit of the first: it concerns the means available for uncovering the future. Accordingly, it is necessary to explore systematically the underpinnings on which forecasts can rest and in connection with which sorts of acquisition problems forecasts are likely to be relatively more successful. These problems of forecast are put off until Chapter 6.

BENEFITS ASSOCIATED WITH LOWER LAND COSTS PER UNIT OF GOVERNMENT SERVICE

Lowering the land cost of producing government services involves "efficiency" in an economic sense: getting the most for a given cost, or minimizing the cost of getting a given level of output. Land is a factor of production, an "input," in the production of most government services. For example, the service, administration, requires land for the mayor's office; the service, education, requires school sites; the service, outdoor recreation, requires park sites. These services, or outputs, all need land as input, though obviously its relative importance for some (recreation) is far greater than for others (administration).

However, for either, some sites are clearly more useful than others. The theory of urban land value emphasizes productivity associated with location in the urban complex; other parameters include size, topography and the existing state of development. For example, a mayor has many contracts with other officials so that an office located close to other government offices is more efficient than one less accessible. School sites have to be above a minimum size, accessible to buses yet not in the midst of heavy traffic, and topographical considerations are relevant to building and maintenance costs. For outdoor recreation, the character of the output depends on the character and location of the site. Obviously, then, some sites are more productive with respect to the final services generated than are others of equal size. Just how efficiency differs is complicated.

The greater productivity can be quantitative—a school on a good site may serve more students at a lower cost than one on a poor site. Or the greater productivity can be qualitative in the sense that outdoor recreation available on an ideal park site is a rather different product from that provided by a poor site in an inconvenient location. In addition to these qualitative or quantitative relations between the input, land, and the government service, there is a price relationship: quality and quantity the same, land can be bought at a higher or lower price and have different carrying costs; thereby the land cost per unit of output can be altered.

We conclude that the benefit from acquiring land in advance—the capacity to lower the cost of the input, land, per unit of service output—can consist of lowering the price of land, output quantity and quality the same, or of improving the quantity or quality of the output, price of land the same. Often, indeed typically, advance acquisition of land affords both forms of lowering land cost—a better site at a lower cost per acre. The two aspects can be combined into a single figure by thinking in terms of the cost per acre (lots, square feet, etc.) for a given productivity. "Productivity" does not refer here to any abstract characteristics of the land but to its capacity to produce a particular government service.

Viewed then in this three dimensional way—utility of service as a function of cost and productivity of land—the advance acquisition of land by public bodies aims to optimize the *efficiency* of land.

The time period over which the optimization ought to apply is that of the useful life of the asset. And since land lasts forever, the relevant time period is theoretically infinite. Actually, however, time discounts and uncertainty make near results so much more valuable than far-off results that the time horizon for viewing optimization is often close. How close under various conditions is a matter to which we return later. For the moment, assume that the interest cost of funds is the only time discount that needs to be viewed.

It is essential that the ability to sell previously acquired land be built into any program of advance acquisition. We assume throughout our analysis that land is acquired in expectation of a future public use rather than as a form of investment or speculation. However, we shall see, and this is very important, that when changes occur so that previously purchased land is *no longer the optimal site for the intended purpose, the local government can realize the full benefit of the advance acquisition only if it is prepared to sell the land.* It is perhaps obvious that if the land later appears to have no possible public use, it should be sold to yield any benefit at all. But it should be sold in other cases too and how, in these contexts, "optimal" needs can be defined is discussed below.

With the importance of the ability to sell any suboptimal land in mind, we can now list the ways in which advance acquisition can lower the cost of land for public use. To anticipate, we shall find that, as a general rule, the value to the public of land acquired in advance is the *highest price the public would be willing to pay for the site* at the time of use. If the advance acquisition program comprehends sale as well as purchase of land, this figure need never be lower than the price at which the prepurchased land can be sold; however, its value to the public will often be greater than the price at which it can be sold. This general rule emerges from a consideration of each aspect of the efficiency benefit in turn.

Forestalling Appreciation in Land Value

If it is expected that land will appreciate in value, then a public agency which buys land early can expect to avoid the necessity of paying a higher price at the time when the land is actually needed. The measure of the resulting benefit is the present discounted value of the difference between the current price of the land and the expected price of the land at the intended date of use.

To recapitulate the analysis of the previous chapter, suppose a plot of land, for which a need is expected five years hence, can be acquired today for $100,000. Suppose also that this plot of land is expected to rise in value to $150,000 during the next five years. What is the benefit to the public consequent to appreciation in value if this land is acquired in advance? The present value of the appreciation of $50,000 five years from now, discounted at an interest rate of, say, 4 percent, is $41,100. This is the benefit to the public if at the target date the site is the optimal one for its intended use.

If at the target date some equally suitable site for the purpose happens to be available at a price lower than $150,000, the benefit of the advance acquisition is still the same (the present value of $50,000) *if the previously acquired site can be sold* for $150,000 and the alternative site purchased instead.

If, however, the previously acquired land is not sold, but is used for the intended purpose in spite of the fact than an equally suitable but cheaper alternative site is available at the target date, the relevant benefit of advance acquisition is restricted to only a portion of the total appreciation—the difference between the acquisition cost of the advance purchase and the market price at the time of need of the cheaper equivalent site (discounted to present value).

Aside from the question of availability of alternative sites, the government should be willing to sell previously acquired land if very large appreciation has caused the site's market value to exceed the capitalized value of the land's contribution to the cumulated stream of public service that it is expected to generate over the years. This is another way of saying that the market price of the site is greater than the highest price the government would be willing to pay at target date. In consequence, some or all of the property should be sold.

How should a public agency determine the amount to be sold? Theoretically, only as much land should be kept as the public would be willing to buy at the market price. This amount is determined at the point where the capitalized value of the services of an additional unit of land is equal to the cost of the land. In reality, there is so much vagueness surrounding public decision making that the theory is difficult to apply. Political reality blurs what the public would be willing to pay for it, and irreversibilities in land use blur what the value of the service would be. However, despite these difficulties there will certainly be situations where the sale of all or part of previously acquired land is called for. It is important that such sale should be possible without embarrassment to the advance acquisition program.

Getting the Best Site

Quite aside from any appreciation expected, advance acquisition is likely to yield the greatest benefit when it is employed to preserve a site desired for a future public use from premature development in an alternative private use. For schools, parks, government offices and for many other public facilities, certain sites are much better suited to the purpose than are others, and officials often feel that it is important to obtain this "best site" for the intended public purpose. Indeed, this was most frequently checked as the most important motive for advance land acquisition in the questionnaire. In one sense, a "best site" is defined in terms of its particular capacity to generate the service for which it is to be used: a wooded area with a stream is a better park site than a flat rocky area; a well drained, level, centrally placed lot on a good access road is a better site for a school than one over an underground creek and toward the edge of the district it is to serve. However, there is also a cost dimension: among sites of a given productivity, the one with the lowest price is the "best." In other words, there is a trade off between productivity and price of land, and the "best site" is the one that is economically most efficient in the sense of providing the highest service yield in relation to its price.

In private business, advance acquisition is often necessary to obtain a desired piece of property at a reasonable price. If the property is bought ahead of need, at whatever time the existing owner offers it for sale, the property can be bought at a fair market price. But if the purchase is put off until the land is obviously needed, the existing owner, recognizing the special needs of the would-be buyer, might "hold up" the buyer, or might even refuse to sell at all. In addition, early purchase can forestall any new improvements on the site which would later raise the cost of acquisition.

For governments the power of eminent domain (a power that governments are usually not at all unwilling to exercise) means that any property can always be obtained at a "market price" uninfluenced by the government's special needs for the land. Accordingly, for governments the advantage of advance acquisition in securing a "best site" (over and above the advantage of price appreciation) is largely confined to that of preventing new private construction incompatible with the future public purpose. But for many public facilities the very specific nature of their site requirements implies that unless those sites particularly suited for future public uses are acquired in advance of need, they may well be prematurely developed for an alternative private use. This problem is typical in the very dynamic situation of land undergoing active development on the fringe of an urban area.

There is a private versus public race for land, with new public facilities, such as schools and parks, not needed until *after* private development has taken place, but with the acquisition of sites for them necessary *before* the right land has been preempted by the very private development which creates the need for new public facilities in the first place (this situation is illustrated in the Montgomery County case study in Chapter 7). But the problem also frequently occurs in fully developed areas when the local government needs additional land to provide new facilities or to expand existing ones; the government must in this case also make sure that no new private construction is undertaken on the sites of the planned future public uses (this situation is illustrated in the Richmond case study in Chapter 8).

Given the assumption that land better suited to a forseeable public use would be developed instead for a private use if it were not acquired by the local government in advance of need, how do we *measure* the benefit of preventing the premature private development by acquiring the land in advance? Our answer is phrased in terms of a rise in price, resulting from new construction, which is distinguished from, and therefore in addition to, the simple appreciation in land value discussed in the previous section.

The size of the additional benefit of forestalling new private construction on the best site for a future public facility is a function of these three factors: (1) what it would cost to acquire and demolish the new construction on the best site at the target date, (2) the alternative sites that would be available at the target date, and (3) the value of the service that this best site would afford in public use. Whichever factor determines the lowest figure for the benefit is the governing one.

Factor (1). If the premature private construction would later be purchased by the government and torn down to make way for the planned public use, it is obvious that advance acquisition of the required land to forestall the private development saves the government the cost of buying and demolishing the new buildings. When the site requirements for a public facility are sufficiently rigid, there may be no alternative to the use of one particular site for the purpose, even if this means demolishing new buildings to use it. Examples of situations where the necessary land is so specific are street widenings (where all of an adjacent band of land is required), highway construction (where everything in the designated path is needed), urban renewal (where all of a large parcel is needed), additions to existing facilities (where only an adjacent site will do), etc. For projects of this sort, any buildings on the desired sites have to be acquired and demolished by the local government to make way for the intended public use. Therefore, advance acquisition which forestalls new private construction on a site desired for future public use will later save the government the cost of acquiring the new improvements and demolishing them. This *cost saving* measures the benefit of acquiring in advance to forestall new improvements during the period prior to eventual public use. It represents an avoided waste of resources put into the construction of improvements that would have an uneconomically short life, and is a reward for planning ahead. The waste of resources if the premature private construction were allowed is the remaining market value of the improvements at the time of their demolition, and if demolition follows not long after construction almost all of the initial cost of constructing the buildings may be lost, with the public paying the cost of this loss.

Suppose, for example, that plans have been made for a street to be widened five years hence. Suppose also that a landowner makes known his intention to construct a new building which would be within the future street-taking lines. It is estimated that if this building were constructed, it would cost $100,000 to acquire and another $10,000 to demolish when the street widening is undertaken. What is the benefit to the public of avoiding these costs five years from now? The present value of this future saving, discounted at an interest rate of 4 percent, would be $110,-

$000/(1.04)^5$, or $90,400. It is separate from, and *additional to,* any appreciation in the value of the land which might occur during the holding period because it *measures only the added cost,* above the value of the land, of acquiring and demolishing any new buildings at the target date.

The Richmond case study illustrates acquisitions that fall into this case. Whenever a landowner applies for a permit to build on land designated for a future public use in Richmond's master plan, the city buys the land if the new improvement would interfere with implementation of the plan. Almost all of the advance acquisitions in the sample selected for analysis were ones for which the acquired site was the only feasible one, and on which new private construction was imminent.

The importance of advance acquisition to block construction of improvements which would soon have to be demolished is not restricted to the savings in future acquisition and demolition costs. Also saved are the relocation problems and inconvenience to owners. It is not possible to set a total dollar value on this benefit, but part of it is the relocation payment which is customarily made when individuals, families and businesses are forced to move. For urban renewal projects, the average relocation payment to families and individuals is $67 and to businesses $2,185. For federal-aid highways, the corresponding figures are $119 and $1,233,[1] and perhaps further uncompensated social costs should be added.

In some cases, advance acquisition to prevent the construction of new improvements may be necessary to maintain the political feasibility of going through with intended public plans. Vested interests created by the new construction may legitimately oppose public use of the land, at least insofar as it would affect them, even if the new use of the land can be justified in broad economic and social terms. Political pressure, needless to say, often can communicate values which are not reflected adequately in the market values of property, and the political turmoil raised by the new vested interests may be able to hamper the local government's plans for a new use of the land. Even when particular vested interests do not oppose the project, the fact that demolition of recent construction to make way for a new use of the land has the air of a public boondoggle may make it politically difficult to proceed. In such cases advance acquisition to prevent new private construction on sites needed for future use yields an intangible benefit above and beyond the simple money saving previously mentioned.

Factor (2). Of course, not all public facilities have such specific site requirements that only one site will do, and simply looking at the cost of acquiring and demolishing new buildings on the first-choice site can *greatly* overstate the benefit of forestalling new construction on that site if substitute sites are available at the target date. That is, if the first-choice site were prematurely developed for private use, it would then not be worth the high cost of buying newly improved property to use this site for a public facility. The Montgomery County case study of school site acquisition illustrates such a situation. The Board of Education tries to find new school sites that are centrally located within the school districts, level and well drained, with soil conditions suitable for construction of a large building, accessible but not on a main highway, serviced by sewer and water, above the legal minimum size, etc. Not many sites have all these characteristics, and there is usually one that, in terms of both its characteristics and its price, is clearly optimal. However, if this site happens to be developed for housing before the Board of Education can acquire it for a school, it becomes far too expensive to be considered as the site for a school, and the best remaining alternative undeveloped site is then chosen. While there is a benefit from forestalling development on the best site until it is needed for the school, this benefit is not, as before,

1. U.S. Congress, House Committee on Public Works. *Study of Compensation and Assistance for Persons Affected by Real Property Acquisition of Federal and Federally Assisted Programs.* 88th Congress, 2d Session, 1964, pp. 37–39.

measured by what it would later cost to acquire and clear the new improvements, for the site requirements are not so specific as to justify that added cost for the site. Rather, the benefit from forestalling premature private improvements on the best site is here the *premium above the value of the unimproved land that the government would be willing to pay at the time of use rather than resort to an alternative location.* This premium may be small if the best site is only slightly preferred to an alternative location; but it can be large if the best site is clearly a much better choice, in terms of its productivity and its price, than any possible alternative.

In those cases where there are no real alternative sites possible, the premium that the government would be willing to pay can be higher than the cost of clearing even a newly improved site; then the benefit of forestalling the new private development is measured as determined by Factor (1); that is, the cost of acquiring and demolishing any new improvements, were they to be built, sets an upper limit to the size of the benefit as measured here.

Factor (3). But even if alternative sites are nonexistent (that is, no other site has a high enough productivity in relation to its price to be feasible), the premium that the government would be willing to pay for the best site is further limited by the possible alternative of scaling down or entirely doing without the planned facility. This is a very likely alternative when a very large area, as for an airport, industrial park, or recreational area, is required, and there is only one good possible site. If this one good site is developed for private uses, the cost of reclaiming it by tearing down new buildings might be greater than the value of the service that the land would afford in public use, and the appropriate decision is then just to do without the site and the service. In this case, the benefit of preventing new construction is measured by the *premium above the market price of the unimproved land that the government would be willing to pay at the time of the need rather than do without the service entirely.*

Thus, even when there would be no feasible alternative site available at the target date, (Factor 2), the benefit from forestalling new private construction on the best site for a future public use, can still be less than what it would cost to acquire and demolish the new private construction, had such construction taken place (Factor 1). In this case, Factor (3), the value of the time-discounted stream of services that the best site would afford in public use, sets the upper limit on the value of the benefit from forestalling premature private development of the best site by acquiring it in advance of need.

As with other benefits, the present value of the best site premium is found by discounting it from the target date of use back to the acquisition date.

Uncertainty of the benefit. Assuming that we have, by means of one of the three factors explained above, measured the benefit of forestalling development on the best site for a future public facility, there are two important points where uncertainty enters: (1) whether any new private construction would actually be undertaken on the site if it were not acquired in advance, and (2) whether the site will actually be used for a public purpose, as anticipated.

On the first point, when there is doubt whether any private construction would actually be undertaken on the best site if it were not acquired in advance, the benefit must be reduced by multiplying the previously measured benefit by the probability (less than unity) that the private construction would take place. Thus the benefit will be greater the more certain the government is that the construction would occur in the absence of advance acquisition. One way to ensure that the probability of new construction is high is simply to wait until a building permit is applied for before buying the land. However, as explained in the Richmond case study, even this policy does not necessarily lead to a 100 percent certainty that construction is about to occur, for it may stimulate spurious building permit applications from owners who simply wish to sell their land and feel that they may get a higher price for it if it is bought by the local government.

The second point of uncertainty is whether the site will actually be needed at the target date, for if it eventually is not used for a government purpose there is no ultimate payoff in obstructing all private development in the meantime. Thus the measured benefit must be further reduced by also multiplying the previously measured benefit by the probability that the site will actually be the one used. The expected benefit is therefore greater the more certain is the eventual government need for the particular site acquired.

Needless to say, it will be difficult to estimate (1) the probability that private construction would occur in the absence of advance acquisition, (2) the probability that the site will actually be needed for a public use, and (3) the size of the benefit at the time of the need if the site is eventually used as anticipated. However, in many cases the size of the potential benefit, (3), can be so large that even fairly risky bets on both points of uncertainty, (1) and (2), will still justify the advance acquisition.

When evaluation is difficult, it can often be avoided. If the more readily measured benefits already exceed the costs, the mere presence of a further intangible best site benefit may be all that is needed to clinch the desirability of advance purchase. In this case there is no reason to try to push toward a quantitative evaluation of the amount of the benefit. Where such quantitative evaluation is necessary in order to determine whether the purchase is worthwhile, the criteria that have been described ought to provide at least a handle with which to grasp the evaluation problem.

SUPPLEMENTARY BENEFITS

Supplementary benefits cover a variety of possibilities. For the most part they are difficult or impossible to measure solidly in monetary terms. Nevertheless, it is important to consider them and the relevant principles of evaluation.

Improvements in the Procedures of Site Selection

One likely benefit from a program of advance land acquisition is improvement for public facilities. For one thing, there is of the whole process of selecting sites simply more time to study site requirements thoroughly if acquisition is made in advance of the actual need for land, thereby making possible a more careful site selection than is possible when purchase is delayed until the last moment.

Another reason to expect that advance acquisition will improve the selection process is that it gives greater scope for coordination in the selection of sites for future facilities. This sort of coordination becomes especially important when a number of independent agencies of government are each responsible for selecting sites for their respective needs. In these cases, the process of advance acquisition focuses attention on the possibility of harmonizing these separate decisions. As an example, the advance school site acquisition program in Montgomery County has led to coordination between the Board of Education and the Park Commission in a procedure for acquiring combined school-and-park sites. A combined site requires less land than would two separate facilities, and the usefulness of each is increased by the proximity of the other.

Improved administration of land may affect the way in which tax-delinquent properties are dealt with. If taken over by the city such properties form, intentionally or not, a temporary land bank. Coordination of such properties with those explicitly acquired for advance purposes could be very useful. Coordinated objectives and management for the two sorts of programs could improve the effectiveness of both.

In connection with individual site selections, these benefits of improved procedures can probably be very substantial, though they are difficult to quantify. But they may be of primary interest as a type of overhead benefit associated with a program of advance land acquisition as a whole.

Improvements in the Pattern of Related Land Uses

There is a group of secondary benefits associated with acquisition of land in ad-

vance, in connection with the production of some particular government service, which do not relate to that service but to another—the improvement in the uses to which the scarce resource land is put. As mentioned at the start of this chapter, improvement of this sort can be the direct target of land-use controls, including advance acquisition. Here it is relevant as a by-product of the increased efficiency of land in producing particular government services.

When the intended future use of land acquired in advance is expected to have an effect on related land uses in the area, an important aspect of the advance acquisition is the reduction of uncertainty attached to other public and private investments having to do with such uses. For example, in Montgomery County the knowledge of future school site locations has aided housing developers in relating new subdivisions to future school service areas and has been used as a selling point for attracting home buyers.

Increased tax revenue can be a further benefit. This can be the case when the knowledge that school sites have been acquired in advance promotes development and increases real estate values. However, there can be compensating costs of providing government services to the developing area. Also, only the particular locale of the increased real estate values, rather than their existence, may have been influenced by the school site; if so, there may be no benefit for the jurisdiction as a whole. The matter is complicated and depends on a variety of particulars.

If advance land acquisitions for specific future facilities (as envisioned in a master plan) are sufficiently publicized, the effect could be to give added credence and power to the master plan itself. When such advance acquisition is combined with other planning inducements such as transportation and utility-extension policies, it may help to guide new private development along lines laid out by the plan. If so, it can reduce the cost of providing transportation and utility services. In a narrow context, the weight to be given to this factor depends on the "pulling power" of the particular facilities for which land is being acquired in advance, and some or even most facilities may have little power of attraction.

In a broader sense, and an important one, advance land acquisition and urban planning reinforce each other. Plans can be better and more realistic if the tool of advance acquisition is part of the planning kit; and advance acquisition is less likely to err if planning is part of the acquisition kit. Accordingly, if urban planning is considered to be "a good thing" its reinforcement constitutes a benefit from advance land acquisition.

Return on Temporary Use of Land

Land acquired in advance can generate income while it is being held. In one sense it seems more natural to think of rents received for land that is being held for some specific purpose as a deduction from a cost: that of carrying the land to target date. But whether we think of it as a benefit or a negative cost is a matter of individual taste. It is convenient to discuss it here as a benefit.

Land being held for future use may be put to a temporary use that is not incompatible with its intended future use. The interim use may be for either private or public purposes, and the evaluation of the potential benefit will be somewhat different in the two cases. Naturally, in either case it becomes more important to consider temporary uses if the time of intended ultimate use is remote.

Temporary private use: The simplest form of private use is a lease-back arrangement. In the terms of the sale contract the seller is granted a lease on the property, subject to appropriate restrictions for its use, until it is needed for its intended public purposes.

The restrictions on temporary use imposed by the lease may vary according to the character of the site and the ultimate public use intended for it. For example,

if a wooded site has been acquired as future parkland, an appropriate lease requirement is that none or only some of the trees may be cut by a tenant.

When a lease-back arrangement is not negotiated, any other appropriate form of temporary lease may be employed when a tenant can be found. However, the administrative problems of finding tenants and overseeing property require some expertise, and a full-scale real estate management operation may be required if many properties are involved. This is not an important obstacle to cities already having real estate divisions to manage the real estate they own. In Richmond, the Department of Real Estate collects rents of over $100,000 a year from leases on city-owned properties, including properties acquired but not yet needed for public use, and the burden of temporarily leasing additional properties acquired in advance is slight. But for cities that have little experience in this field, the management cost may be significant and where this is so it must be set against the rents received to show the net returns from temporary use.

Once the future returns received from private use of a property acquired in advance have been estimated, they must be discounted from the year in which they will accrue back to the date of acquisition to show the present value of this benefit. For example, if an acquisition for use ten years in the future is expected to return a net rent of $2,000 per annum over the waiting period, the present value of this stream of payments at, say, a 6 percent discount rate is $14,720.

Temporary public use: Sometimes it may be more advantageous for property to be temporarily used for public rather than private purposes. In this case, the evaluation of the benefit may be less clear-cut. One indication of the worth of the public use is that the benefit must be equal to or greater than the opportunity-cost of the land in private use. If land that could be leased for $2,000 a year to a private tenant is, instead, used for temporary off-street parking, the value to the public of this use should be at least $2,000 a year or it would be better to lease the land for private use in the first place. This sets a lower limit to the worth of the public use. Another indication of the worth of the public use is the rental the public would have to pay for another site equally suitable for the same purpose. Thus, if an equivalent alternative site could be leased for $3,000 a year, the value to the public of the temporary use of owned land would be no more than $3,000 per year. This may set an upper limit to the worth of the public use. In this way a bracket of maximum and minimum values can be obtained and an intermediate value may be used for purposes of analysis (say, in this case, $2,500) although in most cases it may not be easy to make a precise estimate of benefit. Once the estimate of annual returns in public use is obtained, it should be discounted to show the present value of the benefit, just as in the case of private use.

One sort of temporary public use which has been employed in Richmond deserves mention. This is the leasing of property to charitable or civic organizations at a nominal rent (typically $1.00 per year). In such a case, the benefit from temporary use is not measured by the rent but by the value of the use of the property to the user, with this value being considered a subsidy (donation) given by the local government to the user.

Naturally, it will not always be possible to find a temporary use, public or private, for properties acquired in advance. This may be the case because a lease would be of short or uncertain duration, subject to cancellation upon notification by the local government or because the land is simply of little current use to anyone, as is the case with vacant land on the urban fringe which has already been withdrawn from agricultural use and is merely being held in anticipation of the development of surrounding areas. It may be appropriate to grant a "use permit" for some of these properties that have no rental value. The use permit allows a tenant to use a property without paying rent,

with the condition that he perform certain maintenance functions such as keeping a field mowed or protecting a property against vandalism. This at least relieves the local government of some maintenance costs.

This completes the list of benefits that seem worth mentioning: they are potential advantages from anticipating by advance purchase the acquisition of land that is expected to be used in production of government services. We turn now to their counterparts: the costs that need to be considered.

Chapter 5

COSTS

Costs are of two major sorts—first and foremost the opportunity costs of capital and foregone tax revenue, second the costs of managing land and running an acquisition program.

COST OF CAPITAL

The cost of financing is a function of time and represents a reason why present costs are more pressing than future costs and future rewards less attractive than present rewards. But this opportunity cost of money is by no means the only reason for the time discount that is associated with futurity.

The Meaning of a Discount Rate

For one thing, people may simply prefer current consumption to future consumption and wish therefore to keep their money for present consumption and forego opportunities to invest in government services (consumption) in the future. The preference for earlier rather than later consumption is likely to be reinforced in public affairs by the politician's natural and strong inclination to attach more importance to costs and benefits that accrue in the present than to those that will accrue in the future when he may no longer be around.

For another thing, the future is ordinarily more uncertain than the present. Certain rewards are normally preferred to uncertain ones: a bird in the hand is worth two in the bush. Thus, insofar as uncertainty is a function of futurity a further time discount is implied.

Finally, there are the opportunity costs of the committed resource, money.

In the grand equilibrium sense, all three types of time discounts are presumably reflected in interest rates, and greater uncertainty is evidenced by higher rates than lesser uncertainty. However, for the purpose of dealing with the problem of particular investments, it is preferable to isolate the opportunity costs of capital. The first two sorts of time discounts can then be used flexibly to evaluate particular questions—the politician's aversion to buying future, at the expense of present, rewards, and the uncertainty inherent in one sort of acquisition compared with that in another.

How, then, should the opportunity costs of capital for local governments be determined?

Selection of an Appropriate Rate

A good case can be made for using the borrowing rate faced by the local government in capital markets. This is the rate that is actually paid and therefore in a quite specific sense is the opportunity cost of funds—a return foregone for the benefit from the investment in land. The context is the cost to the citizens as citizens of the local jurisdiction.

Theoretically, the local borrowing rate should be used in a particular fashion. For one thing, the correct rate is that interest rate on the *additional* borrowing—the marginal rate—which the advance acquisition would imply. Indeed, strictly speaking the correct rate is sometimes higher than this figure.[1] But if advance acquisition can be accomplished without borrowing or if the amount of borrowing that it entails is small relative to all borrowing these subtleties can be ignored and the current interest rate on new borrowing is the appropriate charge.

While there are many difficulties in estimating the cost of capital to society as a whole, there is good reason to believe that the typical local government's borrowing rate is lower than the real cost of capital to society when this cost is conceived of as the foregone return on capital which is withdrawn from other productive uses when borrowed by local government. The most obvious reason for so believing is that the interest rate on municipal bonds is in effect subsidized by the Federal (and often state) government via exemption of interest on these bonds from income tax.

Various estimates have been made of the cost of capital to society, and the issue is too complex to deal with here. The estimates have generally ranged from about 5 percent to about 10 percent, depending on assumptions about how the funds are raised and about the private uses from which the funds are withdrawn.[2] However, the higher figures take risk into account. The structure of our analysis builds an allowance for risk into the estimates of benefits themselves.

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1. The marginal rate is: (1) the interest charge on the new borrowing for advance acquisition, plus (2) the increase associated with this additional demand for funds on the interest cost of *all* current borrowing for whatever purpose, divided by (3) the amount of the new borrowing for advance acquisition.

2. For example, Krutilla and Eckstein recommended a figure between 5 percent and 6 percent (John V. Krutilla and Otto Eckstein, *Multiple Purpose River Development*, Baltimore, Johns Hopkins Press, 1958, p. 93 and 102). Hirshleifer, De Haven and Milliman recommend a figure of 5 percent if costs and benefits have been very conservatively estimated; but because of the tendency to overestimate the benefits of public projects they recommend in practice a figure of 10 percent (Jack Hirshleifer, James C. De Haven and Jerome W. Milliman, *Water Supply Economics, Technology, and Policy*, Chicago, University of Chicago Press, 1960, p. 160). Weisbrod estimates the opportunity cost of capital in the private sector at around 10 percent (Burton A. Weisbrod, *Economics of Public Health*, Philadelphia, University of Pennsylvania Press, 1960).

The municipal bond rate is, of course, usually lower than this range (e.g., for an Aa credit rating the long-term municipal bond rate has varied between 2.4 percent and 3.8 percent during the past ten years).[3] But the marginal local borrowing rate can be higher than the average when a sensitive point in the debt structure has been reached, or when the amount of advance acquisition undertaken is relatively large. These considerations may tend to reduce the disparity between the estimates of interest cost to society and to local governments. Nevertheless, the tax exemption alone tends to imply that a local government making investment decisions correctly on the basis of local borrowing rates may be misallocating resources in the context of the wider public interest. However, for several reasons, including the relatively short life of many advance acquisitions, the misallocation may well tend not to be serious.

Influence of Interest Rates on Investments

Since the subject of this chapter is defining costs and suggesting how their magnitudes should be determined, the impact of interest costs on decisions could be left until later when decision rules are considered. However, it is more convenient to consider it briefly here.

A high interest rate will, of course, rule out marginal projects (by showing total costs in excess of total benefits) which a low interest rate will allow to pass. For advance land acquisition, the difference in capital charge can be important to this final judgment because it constitutes so large a part of the total costs.

But interest rates have a futher impact insofar as they indicate how much it is proper to borrow and thus how large the advance acquisition program ought to be. But they wield this power only if particular conditions are met, and it seems unrealistic to think that they typically are.

Assume for the moment that the local government's marginal borrowing rate is accepted as the correct one to use. Then if the local government can borrow freely in the capital market, it should undertake all investment projects for which the benefits exceed the costs, with all future benefits and costs discounted at the borrowing rate. Failure to undertake a project for which benefit exceeds cost implies that the local government is passing up the chance to improve the welfare of its citizens.

This, however, is only true if:

- The benefits and costs have been evaluated correctly;
- Benefits and costs of all other government projects are evaluated, and correctly;
- The same interest cost is used for all types of projects;
- The local borrowing rate itself is determined by a marginal rate that equals the marginal rate of citizens' time preference for present over future consumption.[4]
- These conditions are fulfilled before the legal debt limit is exceeded.

Confronted by this awesome list, we retreat to the notion of capital rationing: The amount of investment in advance acquisition will be determined not by which projects produce benefits that simply exceed costs, but by the further condition that total investment does not exceed some appropriate amount. What that amount is will be determined by the agents of the public and the political process. But such a decision is not likely to be independent of notions held by those agents about the net advantage associated with a particular program and even particular projects. However, if the amount to be in-

3. Moody's Investors Service, *Moody's Municipal and Governmental Manual*, New York, Moody's Investors Service, (Feb. 1960), p. 25. The figures cover 1955 through 1965.

4. What rate of interest the local government would have to pay for borrowed funds cannot be determined without knowing what its total borrowing will be, because it is likely that the interest rate would increase for larger amounts. How, then, should the proper amount of *total* borrowing for a local government be determined? Ideally, funds should be borrowed up to the point where the marginal rate of interest is equal to the marginal rate of citizens' time preference for present over future consumption, and this in turn should equal the citizens' marginal borrowing rates. For a discussion of this particular problem see "The Discounted Cash Flow System," by Bryan V. Carsberg in *Local Government Finance*, February and March 1966.

vested is small, there may be many projects showing benefits in excess of costs which cannot be financed. In this case it is obvious that those showing the greatest excess would be undertaken; that is, projects would be arrayed on the basis of the size of their expected benefits per dollar of invested capital (where interest costs are charged at the municipal bond interest rate), or some other suitable criterion, and undertaken in a fashion to maximize total return.[5] In this way only the more profitable projects would be undertaken. This matter is discussed much more fully in Chapter 7.

If the actual projects undertaken are substantially fewer than those which meet the criterion of benefits in excess of costs, the question of selecting the proper interest rate becomes less critical. The rate could have been higher without changing the number of projects selected. Moreover, in the case of advance acquisition for which the time patterns of costs and of benefits tend to be fairly similar for many projects, even the particular projects selected may not be very sensitive to interest rates.

TAX REVENUE FOREGONE

One result of advance land acquisition is that it removes property from the tax rolls, and the effect of this must be considered by the local government in its plans. When property is acquired for future use a government loses the stream of tax payments that would have been paid if the land had been left in private ownership until the time of actual public use. The measure of this loss is the present value of the stream of lost tax payments, discounted at the appropriate interest rate.

The size of the lost tax payments depends on the assessed value of the property and on the property tax rate. If both are expected to be stable, the present value of the stream of lost taxes is easily calculated. For example, if a piece of land is assessed at $10,000, and the tax rate is 4 percent of assessed value, the stream of expected tax payments is $400 per year. If this land is acquired six years ahead of expected need, the present value of the stream of lost tax payments, discounted at an interest rate of, say, 4 percent is $2,097.

However, when the market value of the land is expected to rise, it is reasonable to expect that the assessment would tend to follow along, though probably with some lag. What is discounted in this case is a rising stream of tax payments that might, depending on the course of land values and on the accuracy and frequency of reassessments, look something like:

Present value of lost taxes

$$= \frac{\$400}{(1.04)} + \frac{\$400}{(1.04)^2} + \ldots \frac{\$550}{(1.04)^5} + \frac{\$600}{(1.04)^6}$$

$$= \$385 + \$370 + \ldots \$452 + \$435$$

$$= \$2{,}514$$

It is difficult to generalize about what the path should be. In Chapter 3, we assumed that it represents a constant rate of rise, which is no doubt unrealistic, though theoretically proper under ideal assessment practices. Failing actual knowledge of assessment histories applicable to each situation, some generalization must be made. We propose the assumption that the assessment will increase in a fashion reflecting the expected price increase.[6] The expected value of the increasing stream of taxes can be ap-

5. The selections can differ for different criteria. Thus the criterion mentioned in the text will not rank all projects in the same way as would a criterion based on the selection of a capital charge that will cause the sum of all projects showing an excess of benefits over costs to exhaust the capital funds. (The appropriate rate can be obtained experimentally by trying one after another. This sort of procedure is recommended by Roland McKean in his *Efficiency in Government Through Systems Analysis*, pp. 82–88 and p. 121.) A somewhat different list of projects may be included in this case than in the other because (1) a high interest rate penalizes long-lived projects relative to short-lived ones; and (2) it penalizes projects in which income is generated late rather than early in the life of the investment.

6. Actually, assessment may usually lag so that something less than the expected increase in prices should be used. Note that this does not assume a declining assessment to true value ratio over time. It assumes rather that for any piece of property the ratio declines between two successive sales. It also implies that the average assessment-to-true-value ratio is usually too low for properties the value of which is rising. "Too low" in this context means lower than the explicit ratio of assessment to market value that appraisers are instructed to use.

proximated by the expected value of an annuity having a middle value. Thus if assessments are assumed to increase in line with the total increase in values over six years—say from $400 to $600, then the expected value of an annuity of $500 at 4 percent for 6 years ($2,621) approximates the correct answer ($2,514).

There is another aspect to the question of foregone taxes: that of taxes lost on improvements which might have been made if the property had remained in private hands. Under some conditions it would not be appropriate to consider this sort of tax loss a "cost" of advance acquisition. For one thing, the prevention of new private construction on a site which has been acquired in advance may very well mean that the construction activity is only diverted, though perhaps with some lag, to another site in the vicinity rather than completely eliminated. Thus, the total of new private construction (and the attendant property taxes) would remain about the same as it would have been without the advance acquisition.

The tax loss on improvements barred by advance acquisition is particularly disadvantageous when the availability of alternative bare sites at target date precludes an offsetting saving on purchase price. This situation was previously discussed.

Even when advance land acquisition does cut down the total of new private construction, and therefore property taxes, this is not wholly a loss to the local government because property taxes are at least to some extent a form of payment for services to property which government is obliged to provide. Less new construction would lead to reduced public service requirements, and local governmental expenditures might be correspondingly reduced. Many governmental expenditures are overhead whose total will not be affected by small changes in the amount of new construction, but some costs are related to specific land uses, and when advance land acquisition leads to a reduction in the variable cost of providing public services, the saving should be deducted from the property tax loss to find the net cost in lost property taxes of blocking the construction of new improvements. Naturally, this factor becomes more important as the size of the area being acquired increases, for with a bigger area, a larger proportion of the cost of government services become a variable cost. For example, if agricultural land for a future airport is acquired, the avoided cost of extending urban services to new developments which might otherwise have been built in the area can be very important. However, if a small improvement in an already-developed area is blocked, there may be no noticeable effect on municipal expenditures.

The conclusion is that the question of what taxes are lost on improvements that might have been made is a tricky one. It cannot be solved by a rule but demands thoughtful consideration of each case. Two ways of handling the matter are shown in the case studies in Chapters 7 and 8.

COSTS OF MANAGING AN ADVANCE ACQUISITION PROGRAM

In addition to the expenses that are associated with an individual acquisition, there are also overhead expenses of running an advance acquisition program. "Overhead" comprehends most of the expense of advance planning necessary before advance acquisition of a particular site is even considered, including the cost of making cost-benefit analyses. In cities where there is already a strong planning organization, much of the groundwork necessary for advance acquisition will have been laid, and the overhead expense occasioned by a program of advance acquisition will be small. However, where this groundwork does not exist, the overhead cost of assembling the personnel and data necessary for undertaking a well thought-out program may be so high as to make it not worthwhile. In the case studies of Montgomery County and Richmond, the overhead cost associated with the advance acquisition appeared very small in relation to the funds spent on land and also in relation to the monetary benefits achieved by the program. However, both of these places did already have most of the machinery necessary for undertaking the program.

In running an advance acquisition program, there is also the cost of managing acquired property during the time period between acquisition and ultimate use. Part of this cost will probably fall into the category of overhead and should be charged as such, but any variable cost that can be directly attached to caring for a particular property should be charged to it in the cost-benefit calculation. When property is temporarily leased to a private operator, these charges can be deducted from the rental to arrive at a net rent; when the property has a temporary public use, the maintenance cost can be deducted from the value attributed to the public use. But when there is no temporary use for the property, the stream of future maintenance costs should be discounted to yield a present value of these costs, and this is weighed separately in the cost-benefit calculation.

Another aspect of the cost of an advance acquisition program is that there is undoubtedly some sort of rationing of talent available to local government. The value of the people who must forecast public land needs and judge when it is worthwhile to acquire in advance is measured not only by their salaries but also by what they could accomplish in alternative public endeavors.

Public interest itself may have a high opportunity cost. Some worthwhile jobs may be left undone simply because it is impossible to marshall sufficient popular attention to generate the demand for their accomplishment. Thus, advance acquisition must contend for the public eye with other worthwhile projects, not all of which can be undertaken. When a competing project is nudged out by advance acquisition, the cost of the advance acquisition is not just the money-expense of undertaking it but also the benefit that could be obtained by the alternative project.

These opportunity costs of talent or public interest are doubtless very real (though more implicitly than explicitly) in the arena of public decision. However, their importance to an explicit effort to evaluate costs is doubtful. We may still be at a stage in the production of government services where the undertaking of more work, and more varied work, will tend to improve the quality of all of it. Over time, neither moderate talent nor public interest may actually be scarce resources.

Chapter 6

THE PROBLEM OF FORECAST

The previous two chapters have assembled the more important advantages and disadvantages that may be associated with advance acquisition of land to be used in the production of the services commonly provided by local governments.

First and foremost among the benefits is improvement in the efficiency of land-input—the services provided per dollar of expenditure on land. This benefit may result from the lower price and/or higher productivity of a given land area. Other benefits include improvement in the procedures of site selection, improved pattern of land use, a boost to planning, and return on temporary uses. The major costs are the opportunity costs of capital and tax receipts foregone. In addition there are various operating expenses.

In each case, the character of the benefit or cost and its justification have been discussed. We have also outlined how each may best be quantified in view of the objective of making sums comparable with one another and therefore additive. Of course, for a number of benefits and costs, the best that could be achieved was rough weighing of possible magnitudes.

All too evident in these discussions was the fact that many of the figures for which the analytic frame calls are forecasts. This appears to be particularly true of the bene-

fits and notably of the two most important ones, the two dimensions of efficiency. Uncertainty is necessarily a part of advance acquisition and this is no argument against it. It is, however, an argument for studying the bases on which the necessary predictions can be founded. A sound judgment as to the character of these bases is a prerequisite to structuring sensible decision criteria. Accordingly, this chapter considers in turn the problems of predicting land needs (in the sense implied by the notion of productivity) and of predicting land prices.

PREDICTING WHAT SITES WILL BE NEEDED

Needless to say the concepts of what land is actually "needed" for public purposes, and of what a "good site" consists, are not without ambiguity. But it is beyond the scope of this study to go into the problems of how governments should, on behalf of the people, make decisions about the amount of land that should be devoted to public purposes; these problems exist whether land is being acquired for current or future use and cannot be discussed here.[1] Instead, assuming that public agents know what they mean by requirements (including quality) we concern ourselves with the process of making predictions about the specific sites that will be needed in the future.

Best Guess

To begin with, some of the guesses about future public land needs are sufficiently close to the present to eliminate almost all uncertainty as to exactly which sites will be needed. A capital improvements program (if one exists) often specifies the general or even precise location of sites necessary for public improvements planned five or six years in the future. Indeed, one of the important advantages often cited in support of capital improvements programming is that it make advance land acquisition possible; there is a substantial degree of commitment to projects approved in the capital improvements program, and advance acquisition of the planned site can be considered with reasonable assurance that it will actually be used for the intended purpose. This is especially so when the capital projects are not described in terms of meeting future needs which are expected to arise, but rather as serving present needs which have been put on a "waiting list" behind higher priority projects; for these deferred projects, the site selection process is little different from that ordinarily required to select sites for immediate use, even though the site will not actually be needed for construction purposes until several years hence.

Another source of information about sites that will be needed for future public use is a master plan. The detail in which a master plan is worked out naturally varies greatly among different areas. The master plan of Richmond, for example, is a relatively detailed comprehensive plan of "Land Use, Community Facilities and Trafficways"; it is quite specific about the location of future public facilities such as schools, parks, fire stations, libraries, highways and street widenings. This detailed sort of comprehensive development plan is usually found only in a larger central city which has an adequate planning staff and an already established pattern of land use. Here, many of the facilities that create new land needs are replacements for obsolete existing facilities or represent upgrading in the standard of service offered and, if there is a reasonably clear picture of the services the community wants to provide, the guesswork involved in selecting the proper locations for these future facilities is substantially eased. When, as in Richmond, a master plan for future facilities has been worked out in detail, and it has the support of the authorities who are going to make the final decisions for the future facilities (the operating departments, planning commission, highway department, city council, etc.), and when the basic expectations lying behind the plan continue to appear likely to be fulfilled (e.g., expectations about population growth and economic development), it is appropriate to use the plan as a guide to future land needs, and the Richmond case study describes one way this can be carried out in practice.

1. There is a large literature dealing with land "requirements." A useful discussion of some customary standards for public land use appears in F. Stuart Chapin, Jr., *Urban Land Use Planning*, Urbana, University of Chicago Press, 1965. See particularly pages 446 and 449.

Naturally, not all guesses about future land needs can be spelled out in the relatively stable framework of a capital improvement program or comprehensive master plan. Particularly in areas on the urban fringe, where population growth is expanding onto previously rural land, the problem of predicting future public land needs is quite different. In these newly developing areas, even if there is a master plan, it is likely to be only a general land use plan which specifies the type of land use (residential, commercial, industrial) and the population density intended for the area, but does not specify the arrangement of future community facilities in enough detail to indicate the particular sites that will be needed. And for many fringe areas there may not be any formal land use planning at all. In these circumstances predicting future public land needs is naturally a hazardous occupation. Nevertheless, even when there is only a rough idea of the pattern of future urban development it should be possible to identify the sites for at least some of the future public land uses made necessary by this new development, and to make a judgment about the continuing supply of these sites if they are not secured in advance. For what sorts of public land uses and under what conditions are the appropriate sites relatively more easily identified in advance?

1. When the facility requires a large area of land. Even when land is acquired in advance, there may be a few alternatives if what is wanted is a very large tract of undeveloped land in or near the urban area, preferably under few separate ownerships, and with other appropriate attributes (such as access to transportation, topography, or relation to similar existing or proposed facilities). Examples of public facilities with such land needs would be a large park, an airport, or a large industrial area. The sheer size of the sites required by this type of facility greatly limits the range of possible choices, and the best site for such a facility may be obvious for some time in advance of the actual need. Indeed, if the land necessary for this sort of facility is not secured early enough, spotty private development in the desired area can drastically interfere with any plans for later turning it to public use. For example, even the construction of scattered new housing on land which is intended as the site of a future airport will either greatly raise the price of acquiring and clearing the land, or else force a relocation of the airport.

2. When the desirable attributes of the land required by the facility are more rather than less highly particularized. Some public facilities require particular topographic or other features which are often recognizable in advance. The "classic" park site is easily recognized: a wooded stream valley, with a variety of natural scenic features, and often rugged terrain which makes the land unsuitable for other urban uses. Other examples of facilities with highly particularized land requirements that lead to easy identification in advance of need are public beaches, historical spots, port facilities, and so on. Once it has been decided that the sites for such facilities should be reserved for future use, it is not difficult to pick suitable sites in advance. However, for this sort of site requirement it is more difficult to make an estimate of the continuing future supply of suitable land. If as with some parks, the particular requirement is for land difficult to use for other urban purposes, then all the possible candidates for sites will probably not rapidly disappear into private development. But when the particular site requirement is for land that is also in demand for private use (e.g., beachfront property), private development can be expected to reduce the future supply of available sites.

3. When the desired location of the land is more rather than less determined by the location of existing facilities. The location for some future land needs may be very definite even though the need is far in the future. The most extreme (though not rare) example is land needed for the intended expansion of an existing facility, such as an additional wing for a museum, or additional classrooms for a school: only an adjacent site will do. A similar case is a future street widening, where land all along one or both sides of the street is needed. In this sort of situation, the supply of feasible locations may be limited to a single site, and any pri-

vate development on this site is sure to raise the cost of the site to the public.

These three general sorts of physical site characteristics can aid in the early recognition of the appropriate site for at least some future public land uses.

However, the siting for many community facilities must also be carefully related to the particular distribution of population which the facilities must serve, and not much can be said about just where these facilities should be located until there is a fairly good picture of the pattern of future settlement. This is the sort of situation dealt with in the case of Montgomery County, where the problem has been to select future school sites in advance of the new residential development that is expected to produce the need for new schools. As described in the Montgomery County case study, it is often possible to infer from the master land plan roughly the appropriate number, size and location of future school sites for areas on the developing fringe of an urban area. An appropriate site for a school is defined partly in terms of characteristics easily identifiable in advance (topography, soil condition, drainage), but also partly in terms of the site's relationship to the residential neighborhood from which it will draw its pupils (it should be in the center of its service area, and easily accessible to all its pupils, among other things). However, it is often necessary to wait until partial development of the new areas has taken place before there is sufficient information about the exact character and timing of this residential expansion to make a final decision on the best location of the future school sites. Thus, although sites are not always selected very far in advance of need, nevertheless the advance period is long enough to insure that the most suitable sites for schools have not all been pre-empted by private development which is itself creating the need for new schools.

There is one potentially important exception to this situation where the supply of sites for public facilities is diminished by the very thing that increases the demand for them. The trend towards larger scale in new subdivision developments is evident in Montgomery County as elsewhere, and housing development subdivisions are increasingly of such a size that the developer is required or persuaded to dedicate a portion of his land for public use as sites for schools, parks, or other community facilities. When this does occur, there is less incentive for the local government to acquire land in advance for public use; if it waits, and if an area is developed as one large unit, the necessary sites may be donated. However, this is not yet the dominant form of new development, and in most cases it will still be necessary to keep an eye on the pattern of smaller scale development activity to discern as early as possible the location of future public land needs.

Self-Realizing Implementation

In making the guesses about land needs for future public facilities, a factor which can be of considerable importance is that the local government can act in a number of ways to shape the conditions that determine what land will be needed for public use. Although local authorities do not have much control over the basic forces influencing the total amount of community growth that is going to take place, they do have considerable influence on the general character and pattern of whatever growth does occur. This influence is exerted through such measures as zoning controls, subdivision regulations, urban renewal policies, land acquisition policies, and the provision of necessary facilities such as highways, sewers, water, and the like. If all these tools are coordinated to shape urban development according to plan, the guesses about future public land needs can be based on a pattern of future land use which is to some extent actually brought about by the actions of those making the guesses. Thus, the selection of sites for future public use need not be merely a response to expected development dictated by private market forces, but rather part of a conscious public policy to initiate a desired pattern of urban growth. In this case, there is a self-realizing aspect to predictions about future land needs, because the local government can actually

act to determine land needs rather than just guess about them.

Flexibility

However, even with such control over development as local authorities possess, long term forecasting of public land needs is a risky operation, since city plans, upon which the guesses about future needs are based, will often not be carried out in their original form, if at all. When it is necessary to make changes in plans to adapt to unforeseen developments, these changes may affect the desirability of particular sites which have been previously acquired for future use. However, when expectations about the future prove to have been mistaken, flexibility in the operation of the advance acquisition program may help to mitigate the impact of the mistakes on the overall balance of costs and benefits.

One type of mitigation is often inherent in mistakes involving moderate overestimation of needs—mistakes tend to be corrected by time. Needs have, historically, had an upward trend because of higher standards or of growing population. "Too much," defined in terms of a target year five years hence, is often "too little" in terms of a target of ten years hence. Though there are additional holding costs involved, they may not be excessive.

A second source of flexibility which can mitigate underestimation of requirements is the fact that land is only one of the factors of production in any government service. Even for outdoor recreation, facilities and personnel are important further factors in generating the service. By increasing the input of factors other than land, the productivity of land can be increased.

The third and most important source of flexibility stems from the fact that it should be possible to dispose of any previously acquired land if subsequent events reveal that it will not be needed for any public use. Arrangements for sale or exchange seem essential to provide the means of adjusting for forecast errors which are not otherwise moderated by flexibility in the public land-use standards or by stretching out the period between acquisition and use and altering factor inputs. For the disposal arrangement to be effective, there must be periodic restudy of future land needs in order to identify any sites that may have lost their usefulness.

It should be obvious that the occasional disposal of a no-longer-needed property is not to be equated with "failure" in an advance acquisition program. For one thing, the land may have appreciated in value so that a profit is made on the transaction even though the land is not used. But more important, the disposal arrangement is simply a way of giving the process of advance acquisition enough flexibility to make it work efficiently in a situation where perfect foresight is *not possible.*

A fourth type of flexibility is administrative. Mistakes can occur because decisions have been made by inappropriate jurisdictions. If so, administrative changes, which match the geography of administrative jurisdiction to that of land benefits or costs, are capable of correcting error. To some extent adjustments within governments can help. But more usually the more relevant adjustments, and those far more difficult to achieve, are among adjacent or overlapping government jurisdictions.

The discussion of the methods of planning for advance site selection has proceeded as though the problem would be approached from the viewpoint of the urban area as a whole. Unfortunately, it is rare that any urban plan is conceived from the point of view of the area as a whole; rather, there are usually separate approaches for each of the many jurisdictions which make up the urban area, and there is little or no attempt to mesh these plans into a coherent whole. Therefore, land needs related to the growth of the total urban area may be neglected merely because there is no organizational level charged with responsibility for the whole area. This political fractionalization may even work against reservation of land for region-serving uses if these uses are for some reason considered undesirable for

any particular jurisdiction (such as a noisy airport or a sewage disposal plant) though obviously beneficial to the entire region. This being the case, it might seem pointless to talk about planning for regional needs as though it were being conducted in the context of the whole area. However, for those land uses which do require a regional approach for any effective advance site selection, talking about them in this way does point up the need for new organizational forms to cope with problems on a regional level. The beginnings of regional planning have been made in some instances, particularly under the impetus of planning for the advance acquisition of land for open spaces. Planning for advance acquisition to serve other regional public land needs is a logical and not difficult extension of this activity, if the case for it can be made persuasively.

PREDICTING LAND VALUES

Changes in prices of particular parcels of land over a period of years can be thought of as the product of three processes: (1) broad long-term trends in land prices which are a function of changes in the value of money and the major outlines of the pressures of demand in broadly defined areas on the fixed resource, land; (2) transition of areas from undeveloped to developed states; (3) random factors influencing the price of particular parcels. These distinctions are not necessarily incorporated in analyses, but they seem useful to keep in reserve in reviewing the available information bearing on prediction of land prices.

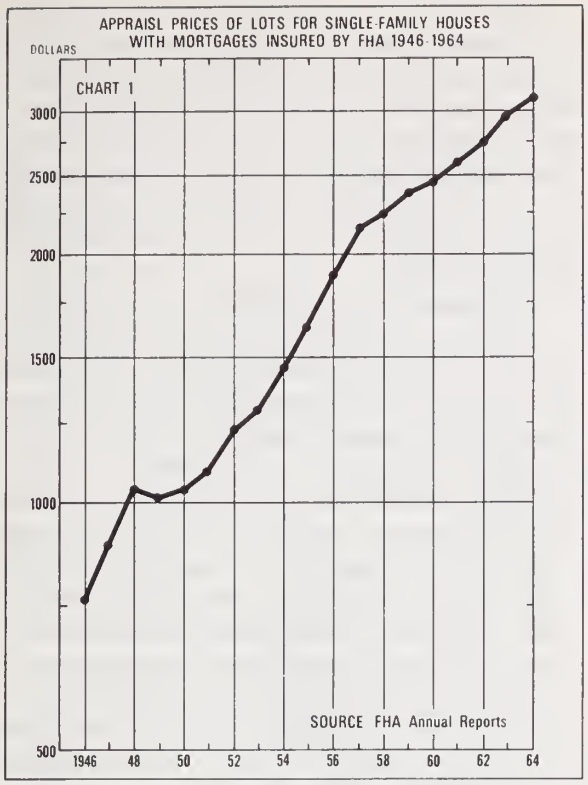
Attempts to study the determinants of land values have been hampered by a general scarcity of good data with which to work, and by the difficulty of measuring accurately the variables that are assumed to influence land values. Despite these difficulties, there have been a few recent empirical studies of the urban land market which shed at least some light on the problem of making guesses about future land values. What do these studies reveal that might bear on guesses about land prices to be made by public bodies when contemplating advance land acquisition?

Studies are of two general sorts: (1) those which simply record land values at different points in time to show the trend —call them "descriptive" studies, and (2) those which try to measure statistically the relationship between land values and several variables supposed to affect land values such as population growth, per capita income, accessibility, and the like— "analytic" studies. It will be useful to review these writings in an effort to learn what concensus they achieve. Comparisons are severely hampered by the fact that different explanatory variables are used in different studies, and even hypothetically equivalent variables are often defined somewhat differently.

Descriptive Studies

The two most broad-based sources of data on trends in suburban land values are a recent study by the National Association of Home Builders (NAHB)[2] and the Federal Housing Administration's (FHA) series on the average appraised value of developed lots used for the construction of new single-family houses with FHA insured mortgages.[3] The NAHB Membership Survey (with a response from 7,100 builders throughout the country) gives the price being paid by builders for raw land and for finished lots in both 1960 and 1964. The information on price per acre for raw land would apply more particularly to the expanding urban fringe. The median percentage rise in price per acre for the over 300 cities was a rate of about 10 percent a year.[4] For the finished lots the median rate was about 7½ percent a year.

2. National Association of Home Builders, *NAHB Special Report 65–8*. Washington, National Association of Home Builders, 1965.
3. U.S. Federal Housing Administration, *FHA Annual Reports*. Washington, D.C., Federal Housing Administration, 1946–1965.
4. Median appreciation for the total four-year period was 47 percent, which implies a rate compounded annually of slightly over 10 percent a year.



One technical point worth noting. The average, in the sense of the central experience of individual cities (median of city figures for percentage rise), is quite different from the change in the average price of acreage for all cities over the period. The latter is weighted more heavily by the cases where land prices were high and increasing strongly. This second sort of average showed a compound rate of increase of 12 and 13 percent for acres and lots respectively, in contrast to the median averages of 10 and 7½ percent. (Incidentally, note also that the relative size of the rise for acres and lots happens to be reversed.) The median figures are more relevant to the question of what is likely to be encountered by individual city programs in advance acquisition.

For purposes of anticipating change, the typical experience expressed in average change should be supplemented by information about differences in the experiences of various localities. The NAHB data shows that in 8 percent of the cities, the price of raw land per acre actually fell; for finished lots, a fall was less frequent (3½ percent of the city reports). But to cover the cost of holding land, prices must not only fail to fall but actually rise. An increase at a compound rate of 4.7 percent per year (reported as 20 percent for the four-year period) would not cover usual costs of interest and lost taxes. Rises smaller than this amount were reported by 12 percent of the cities for the prices per acre, and by 20 percent for the prices per lot. For about a fifth of the cities, then, advance acquisition over 1960–1964 period would have been ill advised if benefits other than appreciation in land values failed to outweigh costs other than those of interest and taxes. Price rises between 4.7 and 6.8 percent per year may or may not justify advance acquisition on the basis of appreciation in land value alone. Changes in raw land prices for another 9 percent of the cities and in lot prices for another 17 percent fell in this range.

The survey shows, then, that if only appreciation, interest, and tax costs are considered, about 70 percent of the cities had experiences that showed a clear benefit if raw land acreage needed in 1964 had been bought in 1960; for finished lots the corresponding figure is 60 percent of the cities. These figures probably give an over-optimistic picture since they report only on sites that builders have seen fit to purchase.

The data for FHA site values are available for the years since 1946, and since 1955 they have been available with a breakdown for about 50 SMSA's. The FHA site values are generally accepted as accurate appraisals of improved residential building lots for new middle income housing at the active fringe of urban development. The national averages for 1946 through 1964 are shown in the accompanying chart. CHART 1. A semilogarithmic scale is used for the prices per lot so that uniform rates of change appear as a straight line on the face of the chart. Clearly, rates of change are quite different over stretches of even five years. Over the whole period, prices rose at an average rate of 8 percent per year. However, prices increased at an average yearly rate of somewhat less than

5 percent between 1948 and 1953, and between 1957 and 1962, whereas they rose by 15 percent a year between 1953 and 1957. Over the three year interval, 1948 to 1951, the rise almost ceased. The experience of local areas would necessarily show wider variation in rates of change. The price of improved lots includes, of course, not only the price of raw land, but also the value of improvements to the land such as rough grading, streets, sewers, and other utilities. The rise in construction prices and consequently in the cost of these improvements over time must have contributed to the rise in value shown here. Also, the average size of building lots seems to have increased somewhat since 1946[5] and this would also account for some of the increases in lot prices over time. The only attempt to disentangle the effects of different influences over time is an excellent study of the San Francisco area by Sherman Maisel.[6] He separated the contribution to change in price made by (1) size of lot, (2) cost of development, and (3) raw land value.

Table 1

SAN FRANCISCO BAY AREA LOT PRICES, DEVELOPMENT COSTS, AND RAW LAND VALUES [a]

	FHA Appraised Value Per Lot	Size of Lot (sq. feet)	Development Cost Per Lot	Raw Land Value	
				Per Lot	Per Acre
1950	$1,300	5,500	$ 700	$ 600	$ 3,300
1960	3,500	6,500	1,535	1,965	9,300
1962	3,850	6,500	1,615	2,235	10,600

[a] Source: Maisel, *op. cit.* The study covered subdivision applications for over 200,000 lots for the period 1950-1962. The figures for raw land value are computed as residuals by subtracting the development cost per lot from the FHA finished lot value.

Apparently the raw land price rose somewhat faster than the other two components, though all elements associated with land acquisition for homes rose substantially in price over the period in the San Francisco Bay Area. The last column indicates that the raw land value rose at a compound rate of about 10 percent a year between 1950 and 1962.

The figures of the NAHB and FHA studies should reflect the broad long-term trend in land prices since they cover plots in more or less the same stage of development (fairly central in the transition from rural to urban) in each successive year. Needless to say, conversion from rural land to urban residential areas involves very large increases in value, and conversion to commercial properties larger still.[7] But for a local government to capture the entire increase in land value resulting from the rural to urban conversion, advance acquisition would be required considerably ahead of any expected public use. Except for the case of large outlying areas needed for recreation, airports, etc., this is probably not feasible. The uncertainty as to whether the rural area will actually be developed for urban use may be too great, except in connection with comprehensive development planning, matters touched on in Chapter 9. Nevertheless, in thinking about probable changes in land values on the urban fringe it is useful to keep the two dimensions of potential price change in mind.

The relative contribution to total price change associated with trend and with transition will be very different for different areas and therefore it is useful to consider them separately. For example, in the case of land on the urban fringe, the transitional dimension will be very large relative to what it is in areas which have already developed. As an instance, con-

5. Christopher Tunnard and Boris Pushkarev. *Man-Made America.* New Haven, Yale University Press, 1963, p. 94.

6. Sherman J. Maisel. *"Background Information on* Costs of Land for Single Family Housing." California, Governor's Advisory Commission on Housing Problems, *Appendix to the Report on Housing in California,* 1963 pp. 221–281.

7. Some of these problems are examined in a forthcoming book by A. Allan Schmid. *Converting Land From Rural to Urban Uses,* Washington, Resources for the Future, 1968.

sider the case of a piece of land which is suitable for a park site, but is in an area not yet touched by active urban development. Its price is $3,000 per acre. It is expected that future housing development in this area will give rise to the need for a park in about five years. How can one estimate what the price of this site would be if acquisition were delayed until the time of expected need? A good rough guess would start with the transitional dimension. It may be approximated by the price that would currently be paid for a physically similar site in an area currently at the stage of development which the outlying park area is expected to reach in five years (say about $5,000 per acre). The trend dimension of price is likely also to contribute to the total rise. The FHA and NAHB figures indicate that the price of a similar site at a comparable stage of development might be somewhat higher in five years than it is now, if the trend in these figures were to continue.

There may or may not be reasons to expect the general trend in land values to continue. But there are certainly reasons to expect development to cause a rise in land prices.

Analytic Studies

Efforts to see into the future are of course aided by whatever knowledge of the dynamics of price change can be acquired. What do the studies show about the factors that have been an important influence on prices?

Although unanimity in results is lacking, the significant variables which emerge are interesting. (The studies summarized are listed at the end of the chapter and referred to here by number.) "Site accessibility" was introduced in a number of studies (1, 2, 4, 7); in each case it was found to be an important variable. However, "accessibility" was defined quite differently in each study (e.g., accessibility to CBD, to employment, to urban function, etc.), so it is impossible to obtain a common measure of its impact. Another variable which is significant in every study where it was tried (6, 8, 9) is personal income. Other variables typically found significant when introduced were population (8, 9), and zoning (1). The only study to consider sewer availability found it highly important (1).

Unfortunately, these studies seem to possess limited usefulness as direct aids to predicting the size of future changes in land values. All except three (1, 6, 8) employ only cross section data, and only one (1) has a really excellent body of data on land values and related variables to work with. However, the results which have been produced are useful in that they have turned up factors which can be examined for hints on the probable trend in land values. Thus, if it is expected that *past trends in population, income, and transportation improvements* (accessibility) will continue into the future, there is reason to believe that the past trend of land values will also continue into the future. Similarly, if *rezoning* for more intensive use is expected, or if *trunk sewers* are to be installed, there is further reason to expect that land values will rise. These influences are, in a sense, self-evident yet it does not hurt to find common sense reinforced by the cold eye of numbers. For public determinations about advance acquisition the evidence is of special interest, since the particular time when these facilities are to be installed ought theoretically to be government knowledge before it is private knowledge. If only the several left and right hands in the bureaucracy could inform one another about what they are doing, the public as a whole could benefit. This information is particularly important if property values in the vicinity of a future public facility will increase as a result of public expenditure. By acquiring early, the public can avoid paying the higher land prices created by its own actions.

Most of the recent descriptive and analytic studies of land prices have referred to land in suburban areas which are undergoing new residential development rather than to land in central cities. One reason for this is the difficulty of getting meaningful data on land prices where almost all of the

available land is improved. However, when land is needed for new public facilities in the central area, the problem is generally to guess what the future value of land plus improvements will be if acquisition is delayed until the time of actual need for a site. When the cost of acquiring the improvements is considered, the cost-benefit calculation can easily be dominated by the benefit of avoiding any new improvement, for although the central area is already mostly built up, there is usually a continual rebuilding on many sites.

When the most important part of the guess about the future turns on whether new construction will raise the cost of acquiring and clearing a site, one way to handle it simply is to wait and see whether any construction is proposed for the site by its owner, and to acquire the site in advance only if some new construction actually is proposed. Of course, to carry this policy out requires some machinery for keeping an eye on all the properties suspected to be likely candidates for future public use (for instance, all properties in an area scheduled for a future urban renewal project). One well-handled program of this type is described in the Richmond Case Study.

Even when there is no threat of new construction it may still be worthwhile to acquire the land in advance for other reasons, and in this case the guess about future property values may be a more important component of the cost-benefit calculation. How much can be said about the trend in central city land values?

Perhaps the most important thing about them is that they seem quite volatile. A recent study (10) on the dynamics of central city land values in the decade of the 1950's found that not only are the trends in land values very different among different cities, but also very different among different areas in the same city.

But within the various areas of each city, the trends in land value seemed to be closely related to the changing fortunes of each area as measured by retail sales, office occupancy, new construction, the character of population groups moving in and out of the area, the area's prestige, and tax and assessment policies. The trends in these variables were very clearly marked, and seemed to have a continuity and momentum of the sort that should be recognizable when a guess about the course of land values must be made. However, the case of each city, and of each area within each city, is highly particular, and not much can be said in general about what will happen to the trend in land values in these areas without detailed knowledge of trends in associated variables of the sort just mentioned above.

Despite the difficulty of empirical work on urban land values, many of the forces which influence the urban land market can be and are grasped at an intuitive level by people who have detailed personal knowledge and long experience with real estate business in any particular area. Even without the ideally desired statistical information, it is often possible for these people to recognize the salient forces at work in the land market at any time, and to make quite educated guesses about the likely trend of future land values in any spot. In particular, almost all cities employ in their real estate assessment offices a number of professional appraisers whose job is to keep track of all land values in the city, and who have information on all real estate transactions taking place in their jurisdictions. It seems very possible that the knowledge of these people could be tapped for estimates of future land values when such estimates are important to the cost-benefit calculation.

There is another way in which this professional familiarity with the real estate market can enhance the value of advance acquisition. When the acquiring agents are in close contact with the market, it should occasionally be possible to buy when owners are eager to sell rather than when the government is eager to buy. Use of this expertise skillfully handled can have the added advantage of reducing the dislocation and delays that accompany condemnation or forced sale under threat of condemnation.

Our efforts to determine the feasibility of assessing future land needs and values have developed a hierarchy of situations that affect the confidence with which the future can be foretold. When a number of the elements that contribute to sound guesses are present the crystal ball is brighter than when they are absent.

Having now completed a description of how information should be used and what sort of information should be sought, a reformulated summary of the structure of cost-benefit analysis for advance land acquisition is in order. The summary will also need to point to some conclusions concerning administrative procedures that have emerged, as the reader may have noticed, as corelatives of the analysis of costs and benefits.

But before moving to these statements, two additional steps will be useful. Case studies help to picture the specifics of general problems. Accordingly, the next two chapters report on two such studies of going programs of advance land acquisition.

The second step consists of an effort to sketch, however superficially, the broader aspects of land-use controls which it has not been possible to include as the central content of this study. This task is undertaken in Chapter 9.

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Chapter 7

MONTGOMERY COUNTY SCHOOL SITE PROGRAM

The Board of Education of Montgomery County, Maryland has for a number of years been acquiring land for schools in advance of need.

Montgomery County is a fast growing suburban area north of Washington, D.C. Between 1955 and 1965 its population increased by 167,000 and its public school enrollment by 54,000. The rate of increase per year was 5 percent for population and 7½ percent for school enrollment. The impressive nature of this growth in school enrollment is shown in Figure 1.

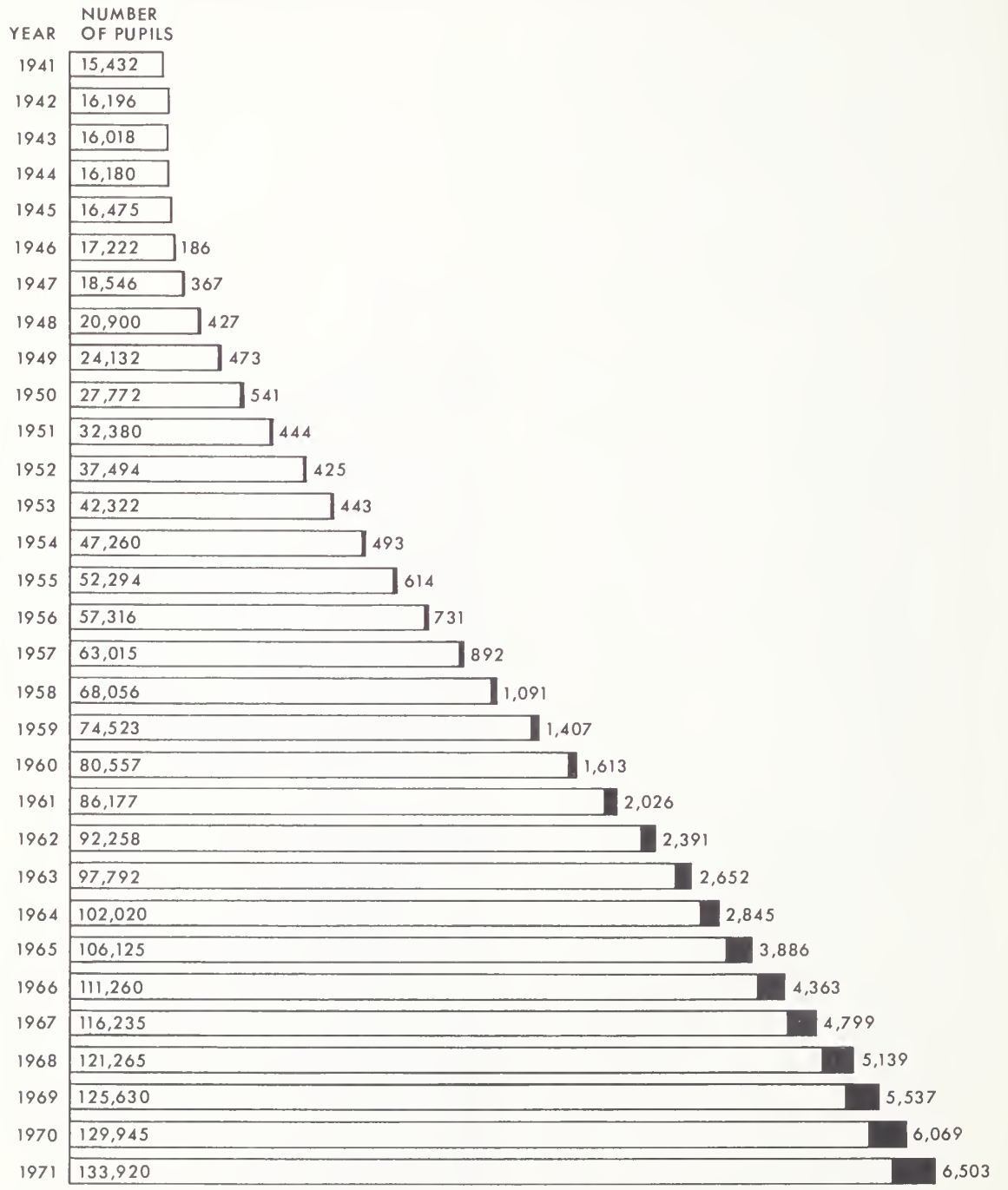
ORIGIN OF THE ADVANCE ACQUISITION PROGRAM

The rapid growth in school enrollment has created severe demands on the school system, and Montgomery County has carried on an active building program to meet its needs; between 1955 and 1965, 67 new schools were built. With this rapid growth extensive advance planning for new facilities has been required to avoid such temporary burdens on existing facilities as crowded classrooms, double sessions, and bussing between schools.

Most of Montgomery County's population growth has been in previously rural areas and the problem for the Board of Education has been to anticipate where and

FIGURE 1

MONTGOMERY COUNTY PUBLIC SCHOOLS
NUMBER OF PUPILS OVER TWENTY-FIVE YEAR PERIOD 1941-1965
AS OF SEPTEMBER 30 OF EACH YEAR FOR GRADES KINDERGARTEN THROUGH TWELVE
(SHOWN IN BLACK AND AS ADDITIONAL STUDENTS ARE THE ENROLLMENTS FOR MJC FOR YEARS 1946-65)
ALSO INCLUDED IS THE PROJECTED ENROLLMENT FOR THE YEARS 1966-71.



SOURCE: Budget Request Capital Expenditures, for the School and Fiscal Year Ending June 30, 1967 (Board of Education, Montgomery County, Maryland)

when the suburban expansion will occur so that it can have schools ready to receive the additional enrollment from new homes. At the very least, anticipation of need by two or three years is essential. The planning of a new school takes about a year, and there is a further lag between the initial request for capital funds for construction and the opening of a school—about one year for an elementary and two years for a secondary school. Some advance planning, then, was unavoidable for an area undergoing growth of the kind experienced in the County.

In 1954 the Board of Education decided to extend the advance planning process to include the advance acquisition of school sites. No one person is credited with originating the idea of an advance land acquisition program; rather it seems to have come in response to a widespread belief that such a program was needed to cope with the rapid growth in school needs.

The belief appears to have been reinforced by an intense interest in education on the part of the inhabitants of Montgomery County; they want a public school system of high quality. The County has one of the highest individual average incomes in the entire country, and a large proportion of the working population is employed at the professional level, to a large extent in positions with the Federal government. Experience has indicated that these people are very vocal and effective in their support of a superior educational system. In such an atmosphere advance acquisition of school sites probably had more acceptance than it would have had in many other areas.

Since the inception of the program the Board of Education has carried on a public relations program, and it is reported that there is now widespread voter support for advance site acquistion and that such groups as the P.T.A., the League of Women Voters, the Montgomery County Citizens Planning Association, and various neighborhood associations have given strong support.

In any event, funds were asked for and granted. In 1954, the Superintendent of Schools requested $300,000 for an advance land acquisition revolving fund in the capital budget. The Board of Education included this request in the capital budget for fiscal year 1955, and the County Council approved it. The fund was increased by $150,000 in 1955, and was further increased every year between 1958 and 1962, and again in 1966, so that the advance land acquisition fund now totals $4,000,000.

OPERATION OF THE PROGRAM

Within the Department of School Facilities of the Montgomery County Board of Education, the Division of Planning and the Division of Site Acquisition carry out the program of acquiring future school sites. The Division of Planning has responsibility for forecasts of population, enrollment, and school needs. The Division of Site Acquisition is responsible for site location and acquisition.

Predicting Future School Needs

In order to buy school sites in advance, the Board of Education first needs reliable estimates of where, when, and how much land will in the future be needed for new schools. Making these estimates is the most difficult part of the advance acquisition process.

To predict the future school needs, the Board of Education's Division of Planning cooperates closely with the Maryland-National Capital Park and Planning Commission (the land planning organization for Montgomery County). This cooperation is important whenever future school needs are being predicted but it is best exemplified by the procedure for preparing master land use plans for areas within the County.

When M-NCPPC develops a master plan proposal for a sector of Montgomery County, it coordinates with the Board of Education to ensure that the area can be efficiently served by schools. M-NCPPC first sends to the Division of Planning an initial draft of each area master plan proposal, complete with topographical maps showing all proposed zoning densities for the area. The Division of Planning projects

the impact of the plan on the need for school facilities in two steps:

1. Dwelling-units-per-acre factors are used to estimate the number of dwelling units that would be built in the area according to the proposed zoning. For example, in Montgomery County R–90 zoning produces 3.0 dwelling units per acre; R–20 zoning produces 21.7 units per acre.

2. Then, pupils-per-dwelling-unit factors are used. These factors are derived from yearly surveys of the school population. For example, current factors used for elementary schools are: .8 pupils per single-family house, and .27 pupils per apartment dwelling unit for R–20 zoning. These factors are subject to continuing study and are adjusted from time to time as conditions change.

The Division of Planning is very much aware of the problems of uncertainty in using pupils-per-dwelling-unit yield factors:

> The accuracy of the factors used to estimate the number of public school pupils per occupied dwelling unit, on the average, is extremely important in determining long range school facilities needs. These factors have been developed for houses as well as for apartments built under the various apartment zoning categories. Some of the many causal forces acting upon pupil yield factors are: number of bedrooms in each dwelling unit, purchase or rental cost, community aging, and parochial or private schools. Pupil yield factors, for any given area, will vary from year to year as well as from the time of initial construction and occupancy of new houses to the time the area ages and is completely developed. Many areas observe housing cycles whereby after low initial yields, a peak is gradually reached as pre-school children move into a school and advance through the grades. It is possible for a school service area to contribute twice as many children to the public school from the same number of houses, within the range of a housing cycle.[1]

However, some measure of flexibility can be achieved when pupil yields vary unexpectedly. It is possible to compensate for the error in prediction by adjusting the boundaries of the school area to include smaller or larger numbers of students.

By this two-step process the Division of Planning obtains from the master plan proposal a distribution of elementary school pupils throughout the area and from this is able to predict the required general distribution of elementary school sites. Some of the considerations in setting boundaries for elementary school service areas are:

- If possible, the school should be within walking distance of all its pupils.
- Natural barriers, such as parks and major streams, are often used as school area boundaries.
- Other barriers, such as railroad tracks, major highways, and industrial areas are also used as school area boundaries.
- There should be a suitable school site in the area, preferably on level ground.
- The history of parochial or private school enrollments is reviewed.

The preliminary work on the master plan proposal by the Divisions of Planning and Site Acquisition may suggest that some changes in the plan would be desirable in order to provide a better distribution of schools, and if so, this is worked out with M–NCPPC before the master plan proposal is presented for public discussion and adoption by the County Council.

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1. "A Plan for Elementary Schools to serve the Aspen Hill-Norbeck Area," Montgomery County Public Schools, Rockville, Md. 1965, pp. 2–3.

In addition to the work on master plan proposals done in cooperation with M–NCPPC, the Division of Planning makes its own independent studies to predict future school needs. Such studies use a procedure similar to the one outlined in the case of a master plan proposal, and are usually made for special areas where some development is already under way but where a master plan does not exist, or where changes have been made in a previous master plan. Enrollment forecasts are made using the existing zoning for the area; however, such forecasts are considered less reliable because without a master plan there is often greater pressure for rezoning to a higher density as development occurs. Accurate enrollment forecasts for a developing area depend to a large extent on stability in land use planning. With an adopted master plan for an area some spot changes in zoning can be expected, but a massive breakdown of a master plan is considered unlikely.

Once the expected pattern of required school sites has been determined in the manner just described, the timing of need for the future sites must also be estimated. Master plans have been prepared for large parts of Montgomery County, and the funds available for advance acquisition set a limit to the number of sites that can be held at any time. Therefore it is necessary to establish the priority in which future school sites should be acquired.

To predict the timing of need for the future sites, the planning and site acquisition staffs keep watch on a number of indicators of the housing development in the County. The most important of these is the path of future sewer and water extensions projected in the five-year capital improvements program of the Washington Suburban Sanitary Commission. Development usually follows quickly after sewers are extended into an area, so the sewer extension plans are a good indicator of the timing of future population movement into an area. In addition, development activity in the County is monitored by examining the building permits issued each month, telephone connection requests, and by keeping in personal contact with housing developers in the area. In this way, the planning and site acquisition staffs obtain a very good idea of where and how much current development activity is going on, and can reasonably predict where and, in a rougher way, when development in the near future will take place.

The previous paragraphs suggest an orderly sequence: first future school sites are identified, and then the time when they will be needed is determined. But actual practice is often less systematic. Often, signs of new or expected development in an area lead the planning staff to make the study of where the future school sites should be located. In any case, both questions—where and when—must be answered. Only then does the site acquisition staff consider specific possible sites for purchase in light of the funds available, with priority given to the sites that will be needed soonest.

Site Selection and Acquisition

The procedure for specific site selection and acquisition is relatively clear-cut. Topographical and tax maps are used to select a number of promising parcels of land, and field surveys are made to cull the most likely prospects. The possibility of a combination park and school site is discussed with M–NCPPC, and if M–NCPPC is interested, a site to serve both purposes is sought. (In such cases, M–NCPPC and the Board of Education share the cost of the site.) The site acquisition staff develops the data necessary to determine the adequacy or inadequacy of the possible sites under consideration. Studies are made of topography and grade problems; of access and location related to school needs; and of road and sewer lines and projected plans for each. When a specific site has been selected, an appraisal is made and soil tests are taken to determine rock condition and foundation problems.

When information on a possible site has been developed and it is acceptable to the staff, the proposal for its acquisition by purchase or condemnation is presented to the Site Selection Advisory Committee. This Committee consists of the following members:

- Two from Board of Education—Director of School Facilities, Director of Physical Education.

- Two from Maryland-National Capital Park and Planning Commission—Director of Parks, Land Planning Director.
- Two from Montgomery County—Director of Public Works, Director of Recreation.
- One from the Washington Suburban Sanitary Commission—Design Engineer.

The members of this committee are well equipped to evaluate the suitability of sites recommended, as each is an expert on one of the various aspects of site selection. The site acquisition staff felt that review by this committee exerts a valuable discipline over site recommendations; they know that a site has to be the best possible one before presentation to an expert working committee.

Present practice is to present to the Site Selection Advisory Committee the data on all sites before action by the Board of Education. If there is unanimous approval by the Site Selection Advisory Committee, the request is forwarded to the Board of Education for consideration. Failing approval by the Site Selection Advisory Committee, the matter is referred to the Co-ordinating Committee. The Co-ordinating Committee consists of the following members:

- County Manager
- Superintendent of Schools
- Maryland-National Capital Park and Planning Commission—represented at commissioner level.
- Washington Suburban Sanitary Commission—represented at commissioner level.

If the Co-ordinating Committee approves the site it is presented to the Board of Education. In practice, if the Site Selection Committee or the Co-ordinating Committee approves the site, the acquisition is authorized by the Board of Education. After final approval, the actual acquisition of the sites is handled by the Site Acquisition Division and the attorney for the Board of Education.

Payment for school sites acquired in advance is made from the Future Sites Account, a revolving fund created for advance land acquisition. When a site is acquired in advance, the Future Sites Account is debited with the purchase price plus incidental costs such as appraiser's and lawyer's fees. The Future Sites Account is reimbursed by the same amount when capital budget funds are appropriated for construction for the school (about one year before occupancy for elementary schools and two years before occupancy for secondary schools). The reimbursement is not automatic, however; it has to be requested in the Board of Education's capital budget and appropriated by the County Council each year. In 1964, a recently elected "economy in government" County Council deleted the Future Sites Account reimbursement of $887,000 from the Board of Education's capital budget request, and in 1965 deleted a further $350,000. However, because of numerous public protests and urging by the Board of Education, the cuts were fully restored in the following year.

An important disadvantage of this annual reappropriation procedure is that the school board is not able to enter into installment purchases or options for future sites, because it cannot legally commit funds that have not yet been appropriated.

EVALUATION OF THE COST AND BENEFITS

When the Future Sites Account was created in 1954, the Board of Education had a very limited staff to undertake advance land acquisition (the present Divisions of Planing and of Site Acquisition consisted at that time of one person each). In the early years of the program most of the funds in the Future Sites Account were actually used to acquire sites immediately needed. The following table shows the breakdown of school sites between those acquired more than one

Table 2

NUMBER OF SITES BOUGHT BY NUMBER OF YEARS IN ADVANCE OF CONSTRUCTION FUNDS

Year of Purchase	More Than One Year in Advance	Less Than One Year in Advance	Ratio of Advance (Col. 2) to Current (Col. 3)
1956	2	5	0.4
1957	1	4	0.25
1958	2	4	0.50
1959	2	4	0.50
1960	5	9	0.56
1961	6	6	1.0
1962	3	1	3.0
1963	4	6	0.67
1964	9	3	3.0

year in advance of appropriation of school construction funds, and those acquired less than one year in advance of appropriation of construction funds.[2]

The figures illustrate the growth of the program. It was not possible to build up a "reservoir" of future sites while still under pressure to acquire sites necessary for immediate use. Only by 1961 had the program progressed to the point where over half on the sites were purchased more than one year in advance of need, and not until 1964 were almost all sites being purchased more than one year in advance. The goal of the Site Acquisition Division is to acquire all school sites about five years in advance of construction, but so far lack of funds and inability to forecast precise site requirements that far ahead have prevented them from achieving this.

Though the program has grown slowly, enough experience has been generated to permit a rough evaluation of the costs and benefits that have resulted on a sample of properties. The more accurately measurable costs and benefits are calculated and set against each other, and then the important intangible costs and benefits are described.

Appreciation in Value

Unfortunately, no estimates of appreciation are available for properties that were acquired for future use and have since been used. However, estimates of current market value are available for properties held in the Future Sites Account as of January 1966, and for these properties it is possible to calculate the appreciation in value between the date of acquisition and January 1966. Estimates of current 1966 market value were made by the staff of the Division of Site Acquisition using data on actual sale prices or appraisals of similar adjoining or nearby properties. The estimates were prepared at the request of the Superintendent of Schools for presentation to the County Council; we have discussed them with an independent appraiser who finds them very realistic.

Table 3 shows the compound rate of appreciation (center column) for the 17 currently owned sites that have been held for longer than one year, along with the size of the site and number of years it has been held.

Table 3

ANNUAL RATE OF APPRECIATION, PURCHASE TO JANUARY 1966

Years Held	Appreciation,* Compound Interest	Size, Acres
1 year 8 months	0	18.2
1 year 8 months	9	17.5
1 year 8 months	11	30.3
2 years 10 months	13	11.2
1 year 7 months	15	30.0
4 years 8 months	16	8.4
3 years 8 months	20	33.0
1 year 8 months	20	9.3
4 years 4 months	21	30.0
7 years 3 months	23	30.4
4 years 9 months	23	8.9
1 year 3 months	25	20.0
1 year 2 months	25	7.9
4 years 11 months	28	9.7
2 years 1 month	30	5.3
4 years 8 months	40	33.6
1 year 3 months	46	7.5

* The rates are compounded annually.

No clear pattern emerges, but there is a general tendency for the properties that have been held longest (4 to 7 years) to fall in the mid-range of appreciation (16 to 28 percent per year); the properties held for shorter periods (1 to 3 years) are closer to the extremes in appreciation (0 and 46 percent per year). This is perhaps because properties held for longer periods are more influenced by the general upward trend in all land values, while properties held for shorter periods are more influenced by sudden jumps in value connected with nearby development. These rates of appreciation are impressive but not surprising to those familar with real estate values in Montgomery County.

Much of the appreciation can be accounted for by the fact that the Board of Education is, in the nature of its operations, buying and using land on the fringe of urban development. It is in this area that new school sites are required as the outward growth of population expands onto land newly converted from rural to urban use. By acquiring sites in advance of development, the Board of Education has in many cases acted early enough to anticipate at least part of the rise in land prices usually associated with this conversion from rural to urban use. The map on the

2. Note that a year in advance of the provision of funds means two to three years in advance of use as a school building.

following page gives the location of land currently being held or authorized for purchase for future school sites as of November 1965, and it shows quite clearly this pattern of acquisition of the fringe of the developed areas of the County.

In addition to the rise in value in specific areas associated with the conversion of land from rural to urban use, there has also been a general rise in almost all land values throughout Montgomery County and this must influence the rate of appreciation of the future school sites. One illustration of this general increase in all land prices is the NAHB survey cited in Chapter 6. For the Washington, D.C. area as a whole, the increase in land price per acre was reported as 71 percent, and in lot prices 62 percent, over the four year period, or a rise at annual rates of about 14 and 13 percent respectively. Although this survey included the whole Washington metropolitan area, it is probably representative of what has happened in Montgomery County.

Measurable Benefits

The dollar benefits result from appreciation and temporary income. Their amounts are developed in accordance with the analysis of Chapter 4. The tables show them for each site (and this is likewise done for costs) in order to make the procedure entirely clear.

Appreciation. In order to set a dollar value on benefits, the appreciation in site value over the holding period[3] must be converted to "present value" as of the date of purchase. This is done for each site in Table 4. The discounting is shown for two rates: the bond rate of 3-1/2 percent, and a higher figure, 6 percent, selected for comparative purposes. Thus the benefit from appreciation at these alternative rates appears in the last two columns of the table.

Return from temporary use of land. Over half of the 29 sites now held in the Future Sites Account are wooded land for which there is no significant temporary use. Of the unwooded sites, three are leased at rentals which provide a very small return. They are:

Yearly Rent	Size in Acres	Market Value of Site 1/31/66	Rent as Percent of Market Value
$ 150	30.4	$212,800	.007
840	33.6	302,000	.028
1,500	18.2	212,600	.068

The rents are very low in relation to the market value of the land because the properties are being temporarily leased for farming or pasture, while the market value of the land is determined by its potential for residential or commercial development. On one other site the former owner was given a special "use permit" as part of the purchase agreement as an inducement to sell. He can continue to farm the land until notified by the Board that it is needed for school construction. Although the returns are low, at least the properties are taken care of by the tenants during the holding period. This is useful since two of the rented properties have farmhouses which would have to be guarded against vandalism or improper use if not occupied.

Table 4

APPRECIATION

Value of Site			Appreciation, Purchase Date to Jan. '66		
At Purchase		Estimated Value		Present Value, Discounted to Purchase Date at	
Date	Price	In Jan. '66	Total Amount	3.5 Percent	6 Percent
(1)	(2)	(3)	(4)	(5)	(6)
1958	$ 46,700	$212,800	$166,100	$131,000*	$110,500*
1961	38,100	126,000	87,900	74,000	65,500
	80,100	160,000	79,900	67,200	59,500
	67,400	178,000	110,600	93,000	82,500
	62,000	302,000	240,000	202,000	179,000
	92,000	210,000	118,000	103,000*	93,500*
1962	101,600	198,000	96,400	84,000	76,200
1963	70,900	100,800	29,900	27,000	25,000
	24,700	42,400	17,700	16,500*	15,800*
1964	229,100	262,000	32,900	30,700	29,300
	221,600	221,600	———	———	———
	194,400	240,000	45,600	42,600	40,600
	68,300	93,000	24,700	23,000	22,000
	228,500	272,000	43,500	40,600	38,700
	151,500	200,000	48,500	46,900*	45,700*
	60,700	79,000	18,300	17,700*	17,300*
	93,200	150,000	56,800	54,900*	53,600*

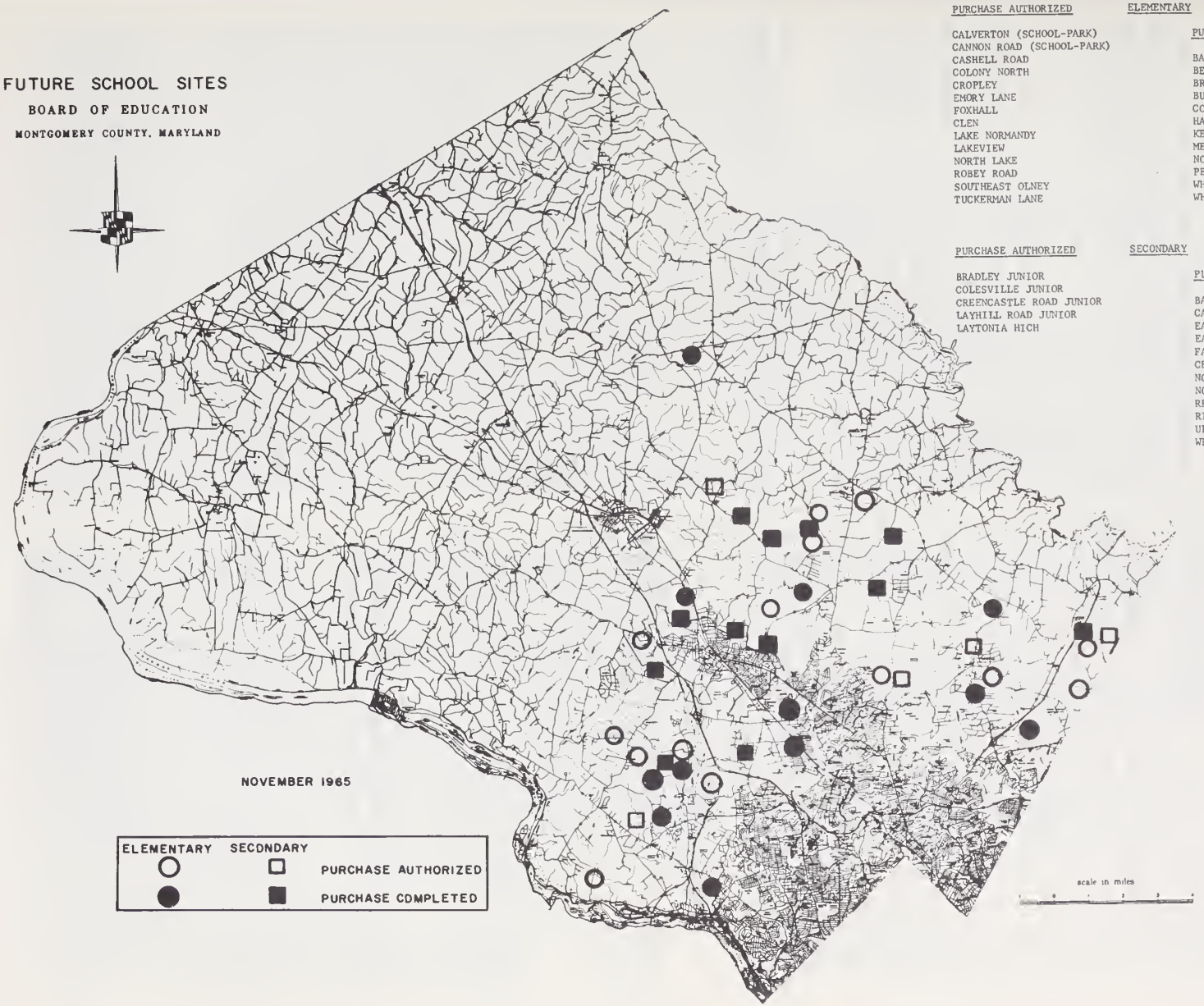
* Properties acquired in the second half of the year are counted as having been held from the beginning of the following year. (Other properties were acquired in the first half of the year and are counted as having been held for the full year.)

3. The terminal date used for all calculations has been taken as January 31, 1966, rather than the actual date of use. No dates of expected use of a sufficiently precise sort were available.

FUTURE SCHOOL SITES

BOARD OF EDUCATION

MONTGOMERY COUNTY, MARYLAND



ELEMENTARY

PURCHASE AUTHORIZED

CALVERTON (SCHOOL-PARK)
CANNON ROAD (SCHOOL-PARK)
CASHELL ROAD
COLONY NORTH
CROPLEY
EMORY LANE
FOXHALL
GLEN
LAKE NORMANDY
LAKEVIEW
NORTH LAKE
ROBEY ROAD
SOUTHEAST OLNEY
TUCKERMAN LANE

PURCHASE COMPLETED

BANNOCKBURN HEIGHTS
BELL'S MILL ROAD
BROOK GROVE (SCHOOL-PARK)
BUCK BRANCH
COLLEGE GARDENS
HALPINE
KENDALE
MEADOWOOD
NORBECK MANOR
PEACHWOOD
WHITE FLINT
WHITE OAK-COLESVILLE

SECONDARY

PURCHASE AUTHORIZED

BRADLEY JUNIOR
COLESVILLE JUNIOR
CREENCASTLE ROAD JUNIOR
LAYHILL ROAD JUNIOR
LAYTONIA HIGH

PURCHASE COMPLETED

BATCHELOR'S FOREST ROAD JUNIOR
CABIN JOHN JUNIOR
EAST ROCKVILLE HIGH
EAST ROCKVILLE JUNIOR
FAIRLAND-BURTONSVILLE HIGH
GEORGETOWN ESTATES JUNIOR
NORTH ROCKVILLE JUNIOR
NORWOOD HIGH
REDLAND SECONDARY
RITCHIE PARKWAY HIGH
UPPER ROCK CREEK HIGH
WEST OLNEY JUNIOR

Only four sites have been put to a temporary private use, and none has been used for any temporary public purpose. The reasons that so few have been used are:

- Many of the sites have a covering of trees which makes the land unsuitable for use.
- A tenant's lease is of uncertain length and is terminated upon notification that the Board of Education will need the site.
- The Board of Education is increasingly buying land from speculators rather than farmers, and the cleared sites have often already been withdrawn from agricultural use before purchase by the Board of Education. Therefore they are not desired on any lease-back arrangement for farming or pasture. None of the three sites being rented is leased to the former owner of the property, and it is difficult for the Site Acquisition Division to search out tenants for short term leases.

The present value of these returns, discounted back to the date of acquisition as described in Chapter 4, are shown in Table 5.

Table 5

INCOME FROM RENT—DATE OF PURCHASE TO JANUARY 1966

		Present Value of All Rental Income, Discounted to Purchase Date At			
		3.5 Percent		6 Percent	
Year Bought	Yearly Rent	Annuity Factor [a]	Amount (Cols. 2 x 3)	Annuity Factor [a]	Amount (Cols. 2 x 5)
(1)	(2)	(3)	(4)	(5)	(6)
1958	$ 150	6.11*	$ 915	5.58*	$ 838
1961	840	4.52	3,800	4.21	3,540
1964	1,500	1.90	2,850	1.83	2,740

[a] The present value of an annuity consisting of the yearly rental income is read from tables that apply the formula $\frac{1-(1+i)^{-n}}{i}$.

* Properties acquired in the second half of the year are counted as having been held from the beginning of the following year. (Other properties were acquired in the first half of the year and are counted as having been held for the full year.)

Measurable Costs

Cost of Capital. The funds required for advance acquisition of school sites are included in the capital budget request which the Board of Education submits to the Montgomery County Council. The Council holds public hearings on the budget request and, after any changes in it are made, votes the appropriation. The Council also determines the financing of the Board of Education's capital program, and in the past the main source of funds has been the sale of bonds by the County or borrowing from the State of Maryland. Small additional sources of funds are the sale of former school sites and state and federal grants. The size of the advance land acquisition revolving fund (Future Sites Account) was over $4,000,000 for the fiscal year 1967.

Following the discussion in Chapter 5, we aim to use the marginal rate on municipal bonds as the interest cost on funds invested in advance acquisition. But in view of the relatively small amount of such investments, it is reasonable to assume that the marginal rate—the cost of acquiring the extra capital required for site acquisition—will be virtually the same as the average rate.

Accordingly, the rate applicable to Montgomery County Bonds has been calculated for the years 1955–1965.[4] It averaged 3.57 percent, and approximately this figure, 3½ percent, was the discount rate applied to costs and benefits.

As mentioned earlier, an alternative way to view the cost of capital used for advance acquisition can be its opportunity cost in other school or county uses. But there is no clear indication that this procedure is called for here. The opportunity cost of advance land acquisition is the foregone benefit of using the funds for some other public purpose. This assumes that use of funds for advance acquisition has actually displaced some other projects. But in Montgomery County aggregate size of the Board of Education's capital budget does not appear to be predetermined. Rather, individual projects are determined and the budget is the total of those needs as recognized by the Board of

4. Moody's Ratings for Montgomery County General Obligations were obtained from *Moody's Municipal and Government Manual*, Moody's Investors Service, New York, N.Y., Feb. 1966. The interest rate for each year was taken as Moody's Average Bond Yield for the rating assigned to Montgomery County in that year.

Table 6

COST OF CAPITAL, DATE OF PURCHASE TO JANUARY 1966

Year Bought	Price of Site	Yearly Interest Payment at 3.5 Percent	Yearly Interest Payment at 6 Percent	Present Value of Interest Cost, Discounted to Purchase Date at 3.5 Percent: Annuity Factor [a]	3.5 Percent: Amount (Cols. 5 x 3)	6 Percent: Annuity Factor [a]	6 Percent: Amount (Cols. 7 x 4)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1958	$ 46,700	$1,630	$ 2,800	6.11*	$10,000	5.58*	$15,600
1961	38,100	1,330	2,280	4.52	6,000	4.21	9,600
	80,100	2,810	4,810	4.52	12,700	4.21	20,200
	67,400	2,340	4,050	4.52	10,600	4.21	17,000
	62,000	2,170	3,720	4.52	9,800	4.21	15,700
	92,000	3,220	5,520	3.67*	11,800	3.47*	19,100
1962	101,600	3,550	6,100	3.67	13,100	3.47	21,200
1963	70,900	2,480	4,250	2.80	6,900	2.67	11,300
	24,700	865	1,480	1.90*	1,600	1.83*	2,700
1964	229,100	8,000	13,700	1.90	15,200	1.83	25,100
	221,600	7,750	13,300	1.90	14,700	1.83	24,300
	194,400	6,800	11,600	1.90	12,900	1.83	21,200
	68,300	2,390	4,100	1.90	4,500	1.83	7,500
	228,500	8,000	13,700	1.90	15,200	1.83	25,000
	151,500	5,300	9,100	0.97*	5,100	0.94*	8,600
	60,700	2,130	3,640	0.97*	2,100	0.94*	3,400
	93,200	3,260	5,600	0.97*	3,200	0.94*	5,300

[a] The present value of an annuity consisting of the yearly interest payments is read from tables that apply the formula $\frac{1-(1+i)^{-n}}{i}$.

* Properties acquired in the second half of the year are counted as held from the beginning of the following year.

Education and the County Council. Insofar as there is little evidence of "capital rationing," there is not the necessity in this case to examine the rate of return that other capital projects might have yielded. Needless to say, the question is not black and white, and we illustrate the implications of a different interest rate by also making the calculation of costs and benefits with an alternative interest rate of 6 percent.

In Table 6, the interest cost (at both 3-1/2 and 6 percent) is shown for each property from date of purchase to January 1966. The present value of the stream of payments over the holding period is the cost of capital which needs to be set against the present value of the benefits.

Property taxes foregone. The tax loss on sites being held for future use depends on the property tax rate and on the assessed value of the property.

In Montgomery County the tax rate on assessed value differs within the County, as there are individual area taxes for such special services as fire protection, parking lots, recreation, etc. For 1965, the minimum tax rate was 3.09 percent and the maximum 4.21 percent of assessed value.

Real property is officially assessed at approximately 60 percent of estimated current market value. This 60 percent figure applies to the value of both land and improvements, which are assessed separately. But Maryland also has a special agricultural assessment law which provides that land used for agriculture be assessed at its value in agricultural use regardless of possible higher market value due to potential development.[5] Assessment on this

5. This special assessment provision was instituted by amendment to the Maryland Constitution in 1960 to help preserve open space agricultural land in growing urban areas, particularly around Washington. However, as the criteria for including property in the agricultural assessment category are very liberal, there is widespread concern that a major result of this law has been to reduce the taxes on land being held for speculative purposes, and that the law may not permanently preserve significant open space.

Table 7

TAXES FOREGONE, DATE OF PURCHASE TO JANUARY 1966

Date of Purchase	Assessed Value of Site			Average Annual Tax at 4.21 Percent Rate [b]	Present Value of Taxes Foregone, Discounted to Purchase Date at	
	At Purchase	For Jan. '66	Average [a]		3.5 Percent [c]	6 Percent [c]
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1958	$ 5,800	$36,590	$21,195	$ 894	$5,450	$5,000
1961	9,040	19,400	14,220	600	2,740	2,530
	13,870	28,420	21,145	890	4,030	3,750
	10,700	42,270	26,485	1,130	5,100	4,760
	22,690	40,970	31,830	1,340	6,050	5,650
	2,280	30,000	16,140	680	2,500	2,360
1962	17,060	17,060	17,060	719	2,640	2,500
1963	17,090	29,450	23,270	980	2,740	2,620
	4,830	12,520	8,675	364	690	665
1964	19,030	19,030	19,030	800	1,520	1,470
	NA	NA	NA	NA	(5,300) [d]	(5,100) [d]
	NA	NA	NA	NA	(5,300) [d]	(5,100) [d]
	10,070	18,000	14,035	593	1,120	1,080
	41,700	90,890	66,295	2,790	5,300	5,100
	2,300	60,000	31,150	1,310	1,270	1,230
	11,410	34,300	22,855	965	935	905
	19,820	52,500	36,160	1,520	1,470	1,430

[a] Average of value at puchase and in January 1966.

[b] Column 4 × 0.0421.

[c] Column 5 multiplied by annuity factors as given in Table 6. (Or see interest tables on present value of an annuity.)

[d] Assessment figures not available. Taxes foregone are estimated by applying taxes for property of about the same purchase price in 1964.

basis may apply to a good bit of land in the urban fringe, and for such land assessment may be extremely low in relation to market value.[6] Considerable underassessment is suggested by the figures for the properties acquired by the Board of Education. At time of acquisition, the assessment ranged from 1 percent to 37 percent of the purchase price for 15 properties, (assessments for two properties were unavailable), and the 1966 assessment ranged from 7 to 43 percent of the estimated 1966 market value.

Table 7 gives the calculation of discounted value of taxes foregone on each property held for future use. As explained in Chapter 5, taxes should be based on rising property values. As a rough approximation of what such a procedure would generate, we use the midpoint in assessed value over the period held, and assume for purposes of discounting the tax stream that this applies to the whole period.[7] The column heads of the table spell out the procedure that generates the present value of the cost to the County of tax income foregone by advance acquisition of land for public purposes.

6. One study found that in some areas of Maryland nearest urban centers, assessments were as low as one-fifteenth of what they would have been if based on market value. Peter House, *Preferential Assessment of Farmland in the Rural-Urban Fringe of Maryland.* Economic Research Service, U.S. Department of Agriculture, Washington, D.C., 1961, p. 10.

7. We have purposely made what we believe to be a liberal allowance for the tax cost. The tax rate chosen is the highest in the range of actual rates, which varied from $3.090 to $4.210 per $100 of assessed valuation. The choice of the midpoint of assessed value also tends to give a high figure. An upward bias is also implied by the fact that for over half the acquisitions, the assessments were raised immediately after the Board of Education purchased the property. As assessments are often based on recent sales data, this is an indication that the assessments would not have been raised if there had been no transfer of the property.

But there is a further possibility of tax loss. If properties had remained in private hands improvements might have been constructed on the land. If so, there would have been taxes paid on these improvements. Should this potential income from taxes also be viewed as a cost of advance acquisition?

In most cases a negative answer seems indicated and therefore we neglect this aspect of foregone taxes. There are two main reasons. First, in a rapidly growing area like Montgomery County, any improvements which might have been made on these properties were probably merely diverted to other land in the vicinity rather than blocked completely. If so, the total new improvements (and taxes) would remain about the same, and only the geographic distribution would be slightly different. Second, even if some potential improvements were blocked completely and not just diverted to other land, schools are usually required very shortly after the time that active development gets underway in any area. Thus, it is at just about the time that the property will be needed as a school site that any potential improvements would be blocked, and any taxes which might have been lost on potential improvements would probably be lost for only a very short time.

The figures in Table 7, then, remain our best estimates of taxes foregone during the holding period of land purchased by the County in advance of use.

Administrative costs of operating the program. The staff of the Divisions of Site Acquisition and Planning felt that very little additional working time on their part was required to conduct the advance acquisition program, because most of the work involved in advance acquisition must also be performed in the case of acquisition for immediate use.

In addition to the work on acquisition of sites, both Divisions have a number of other responsibilities. The Division of Site Acquisition aids in the development of sites for school construction and in the improvement and rehabilitation of existing school sites. The Division of Planning furnishes and equips new schools and additions to existing schools, prepares specifications for new school buildings and works with the architects, makes surveys of the school system and adjusts school district boundaries, and works on improving school building design.

Thus, only a small proportion of the operating budget of the Divisions of Site Acquisition and Planning can be attributed to the advance nature of the school site acquisitions. The staff felt that 10 percent would be a high estimate for this figure. The total operating budget of the two Divisions was $113,435 in fiscal year 1965. This would suggest that $11,000 is a liberal estimate of the administrative cost of the advance acquisition program in fiscal 1965. The cost in earlier years would have been lower because there were fewer employees and lower salary levels. For instance the total number of full staff positions in both Divisions was 13 in 1965, 9½ in 1963, and three in 1955. Using this information, we construct the exceedingly rough estimates shown in Table 8 covering the years when any of the 17 properties in the sample were acquired. Since the expenses accrue at the time the decision and purchase are made, they are already on a present value basis and need no further adjustment. They are ready to be added to the present value of the other costs.

But the table indicates that the figures are small. Furthermore, attribution of

Table 8

ADMINISTRATIVE COSTS FOR ADVANCE ACQUISITION

Year	Estimated Amount
1958	$ 3,000
1961	5,000
1962	7,000
1963	8,000
1964	10,000

costs to individual projects can only be done in some arbitrary fashion, as on the basis that the cost per project is the same for all projects done in one year but differs from year to year (since the overhead may be charged to one project in some years or divided among as many as eight in one year). A further ambiguity derives from the fact that the administrative costs also cover the sites acquired in advance but put to use prior to January 1966, and therefore not included in our sample. In view of the smallness of the charge and the unavoidable inadequacy of its estimation, we have not included administrative overhead in our computations. The chief reason for putting it in would be to point to the need for a better figure.

Comparison of Measured Costs and Benefits

Each cost and each benefit has now been estimated and discounted back to its value at the time when the decision to buy or not to buy was made. These present value figures may be added together. The results are shown in Table 9 using the 3.5 percent discount rate and in Table 10 using the 6 percent rate.

Table 9

SUMMARY OF COSTS AND BENEFITS, PRESENT VALUE
INTEREST AT 3.5 PERCENT

(Thousands of Dollars)

	Benefits			Costs			
Year Bought	Appreciation	Rental Income	Total [a]	Interest on Capital	Taxes Foregone	Total [a]	Net Benefit [a]
1958	131.0	0.9	131.9	10.0	5.4	15.4	116.5
1961	74.0	—	74.0	6.1	2.7	8.8	65.2
	67.2	—	67.2	12.7	4.0	16.7	50.5
	93.0	—	93.0	10.6	5.1	15.7	77.3
	202.0	3.8	205.8	9.8	6.0	15.8	190.0
	103.0	—	103.0	11.8	2.5	14.3	88.7
1962	84.0	—	84.0	13.1	2.6	15.7	68.3
1963	27.0	—	27.0	6.9	2.7	9.6	17.4
	16.5	—	16.5	1.6	0.7	2.3	14.2
1964	30.7	—	30.7	15.2	1.5	16.7	14.0
	—	2.8	2.8	14.7	5.3	20.0	—17.2
	43.0	—	43.0	12.9	5.3	18.2	24.8
	23.0	—	23.0	4.5	1.1	5.6	17.4
	40.6	—	40.6	15.2	5.3	20.5	20.1
	46.9	—	46.9	5.1	1.3	6.4	40.5
	17.7	—	17.7	2.1	0.9	3.0	14.7
	54.9	—	54.9	3.2	1.5	4.7	50.2
Total	1,054.5	7.5	1,062.0	155.5	53.9	209.4	852.6
Average							50.2

[a] Figures may not add precisely because of rounding.

Clearly the financial results of the program have been good. All but one of the purchases show a net benefit even at a time discount rate of 6 percent a year rather than 3½ percent. The average of the *net benefit* for the 17 projects at the 3½ percent discount rate was $50,200 and at 6 percent $38,700.

Thus far only costs and benefits measurable in dollars have been considered. It is necessary to judge whether the net benefit that these measurable results yield may be overweighed by intangible costs of some sort.

Table 10

SUMMARY OF COSTS AND BENEFITS, PRESENT VALUE
INTEREST AT 6 PERCENT

(Thousands of Dollars)

Year Bought	Benefits			Costs			Net Benefit [a]
	Appreciation	Rental Income	Total [a]	Interest on Capital	Taxes Foregone	Total [a]	
1958	110.5	0.8	111.3	15.6	5.0	20.6	90.7
1961	65.5	—	65.5	9.6	2.5	12.1	53.4
	59.5	—	59.5	20.2	3.8	24.0	35.5
	82.5	—	82.5	17.0	4.8	21.8	60.7
	179.0	3.5	182.5	15.7	5.6	21.3	161.2
	93.5	—	93.0	19.1	2.4	21.5	71.5
1962	76.2	—	76.2	21.2	2.5	23.7	52.5
1963	25.0	—	25.0	11.3	2.6	13.9	11.1
	15.8	—	15.8	2.7	0.7	3.4	12.4
1964	29.3	—	29.3	25.1	1.5	26.6	2.7
	—	2.7	2.7	24.3	5.1	29.4	—26.7
	41.0	—	41.0	21.2	5.1	26.3	14.7
	22.0	—	22.0	7.5	1.1	8.6	13.4
	38.7	—	38.7	25.0	5.1	30.1	8.6
	45.7	—	45.7	8.6	1.2	9.8	35.9
	17.3	—	17.3	3.4	0.9	4.3	13.0
	53.6	—	53.6	5.3	1.4	6.7	46.9
Total	955.1	7.0	961.6	252.8	51.3	304.1	657.5
Average							38.7

[a] Figures may not add precisely because of rounding.

Intangible Costs

The most obvious and important intangible cost is the risk of acquiring properties that are found not to be needed when the projected time of use comes along. As stated earlier, the impact of this cost will be very different if the power and the willingness to sell property has been built into the program from the start.

The risk of acquiring unneeded or inadequate sites. There were no reports that any of the sites which had been acquired in advance and subsequently used were unwisely chosen. There is, however, the possibility that some of the sites now being held may be found to be less than optimal when the time comes for future schools to be constructed. Conditions can quickly change in areas of rapid growth, and expectations of population movement may not materialize. However, the Board of Education has full authority to sell or exchange any property which it finds no longer to have any educational purpose and so is not committed to use a site for school construction merely because it was originally acquired with that intention. This flexibility greatly reduces the risk of possible disadvantages associated with mistaken land use forecasts.

Recent innovations in Montgomery County's zoning and subdivision regulations have introduced a new consideration into the future site acquisition process that may cause additional uncertainty in acquiring elementary school sites in advance. The County now has a provision for cluster zoning of subdivision tracts greater than 50 acres, which enables developers to increase the housing density on part of their land in return for dedicating a portion of the land for school sites or parks. This raises the possibility that many future school sites will be contributed free to the Board of Education if large areas are developed under the cluster zoning arrangements. Thus the Site Acquisition Division must now decide between acquiring school sites in advance, when land values are lower, or waiting until devel-

opment actually occurs, in the hope that the school sites may be donated. As the cluster development ordinance was passed only in March 1966, it has not yet had, but soon may have, an effect on site acquisition procedures. The chief effect will probably be on elementary school site acquisition, because it is not expected that subdivision developers will donate enough land or land of the right sort for secondary schools, which usually draw their students from areas much larger than the typical subdivision.

In the case of the Montgomery County program, then, intangible costs seem to have been of little consequence. Were they greater, it would in any event be necessary to weigh them against intangible benefits before judging their impact on the cost-benefit calculation as a whole.

Intangible Benefits

As it is, there are a number of intangible benefits for which dollar figures are not readily available but which add to the value of the program as a whole. Though it would be possible to try to make some rough judgments about their impact in dollar terms, there is no need to do so here. The projects were worth undertaking without these added advantages. However, the character of these additional, but not readily measured, advantages should be recognized.

Securing the best site. The staff of the Site Acquisition Division felt that this is the most significant benefit of the future sites program. By acquiring in advance of development, there is a greater selection of suitable school sites from which to choose. If acquisition is delayed until time of need, some or most of these sites are pre-empted by the very development that makes the new school necessary. The choice of sites is then restricted to whatever land has been left vacant, since the cost of purchasing and demolishing new improvements makes the price of such property much too high for consideration as a school site.

Thus, by acquiring in advance of need, there is more likelihood of obtaining the site best suited to school needs. Some of the factors important in selection of a school site are:

- The site should be near the center of the neighborhood it is to serve. This is especially important for an elementary school because it is considered desirable that most students should be within walking distance of the school. Also, a central location reduces the amount of school bus service required. As this service is estimated to cost $30 per student per year, a location that minimizes bussing to school has an advantage in operating costs.
- Elementary schools should be located away from major roads and heavy traffic.
- High schools should have access to a major thoroughfare and should be insulated from residential uses by natural or manmade physical separators.
- The site should conform to the state requirement for minimum size of ten acres for elementary, twenty acres for junior high and thirty acres for senior high schools.
- The site should be level, properly drained and otherwise suitable for building without excessive cost.

These requirements are so specific that some land is clearly much more valuable as a school site than it would be for any other use. For this reason it is desirable to reserve such land for future school use. Just how valuable this is would be impossible to say with any precision, but it is clear that the impact of the quality of the site on school costs and services can be substantial. The cost of the site usually accounts for only about one-sixth of the total investment in a new school, but even small differences in the quality of the site can have a magnified effect on both construction costs and annual operating costs.

Improving the site acquisition procedures. The procedures introduced by the advance acquisition program have improved the administrative and planning process in several ways and thereby made it possible to improve the quality of the sites acquired.

For one thing, the creation of the Future Sites Account has greatly helped to sim-

plify the budgetary procedure for school site acquisition. The revolving fund eliminates the need to wait for appropriation of specific funds for each school by the County Council before site acquisition can take place. Therefore the Site Acquisition Division can carry out the job of land acquisition with a minimum of delay and red tape. This may even make it possible to buy sites more advantageously than is sometimes possible when the whole gamut of sequential negotiations and authorizations needs to be played out one by one. This freedom of action, combined with detailed advance planning and careful review by the Site Selection Advisory Committee seems to be a decided improvement.

An improvement in the quality of sites is also implicit in the increased cooperation between M-NCPPC and the Board of Education, an outgrowth of the advance land acquisition program. Before the program began, there was little contact between the two. Now there is an effective coordination of school site acquisition with the master planning process. One result of this coordination is the recent policy of joint consideration by M-NCPPC and the Board of Education of combined school and park facilities for all new elementary school sites. The park-school provides consolidated facilities educacational, recreational and community activities in a neighborhood. It is an efficient arrangement because the park-school can be located on a site smaller than would be required by separate locations, and the recreational building can be combined with the school building at a further saving in cost.

Another result of the growing cooperation between the M-NCPPC and the Board of Education is the feedback that advance planning for schools has had on the master planning process itself. Formerly, master plans for areas within the County were prepared without detailed knowledge of the resulting pattern of school requirements. Now the preliminary area master plans are checked by the Board of Education's Planning Division, and changes are suggested if a plan would cause difficulty in locating schools properly.

Benefits to private development in the County. The Suburban Maryland Builders Association has encouraged the advance acquisition program not only as good public policy but also as an aid to developers in planning their operations in the County. Knowledge of where future schools will be located enables housing developers to plan their subdivisions more effectively, and reduces the chance that the Board of Education will need to take part of their property after plans for subdivision have been made. Also, future school sites are prominently signposted to announce the location of the future schools, and this benefits homebuyers by reducing uncertainty as to the proximity of new houses to schools.

Thus, although the intent of the advance acquisition program has not been to influence the path of development in any way, it has had the beneficial effect of reducing an important aspect of uncertainty, that of school location, for both the builders and buyers of new housing.

EVALUATION OF THE PROGRAM

The conclusion of this examination of the advantages and disadvantages attributable to the Board of Education's advance land acquisition program is clearly that it has been of substantial net benefit to Montgomery County. Better school sites have been acquired at lower costs than would otherwise be possible, and the process of site selection has been improved so that it now has a positive effect on the master planning process.

Alternative Measures of Benefit

Granted, then, that important intangible benefits have been present, it will be useful to return to the measurable benefits and consider what information is conveyed by the measures that have been developed. Evaluation is limited to the portion of the program here examined, though there is no reason to suppose that advance acquisition for the 16 sites already in use,

and therefore not covered by our tables, was any less advantageous.

For the acquisitions examined, there was a total net measured benefit of $850,000 (assuming a 3½ percent interest rate) on the $1,830,000 invested. The average net benefit was roughly $50,000 a project ($39,000 at the 6 percent rate), and there was only one for which benefits failed at least to equal costs. If administrative costs are added, as they must be, the average net benefit is slightly reduced, perhaps to something on the order of $48,000 ($37,000 at 6 percent).

This apparently advantageous result might be criticized on the gounds that the advance acquisition program did not go far enough, and that it should have been extended to include advance acquisition of other school sites that were needed. Profitable opportunities may have been lost by failure to do more.

However, it may be argued that there are limits to the funds that may be devoted to advance acquisition, and that these limits are reached at a level where more projects than can be undertaken show substantial net benefits. What do the figures suggest concerning criteria for choosing among the candidates, all of which are appealing?

In order to answer this question it is useful to study a set of figures. Shown in Table 11, they are the data for the results experienced, though to throw light on decision criteria we shall have to pretend that they refer to expectations instead.

Column 3, the net benefit, seems to provide a poor basis for preferring one project to another. Projects 2 and 4, for example, promise about the same net benefit, but project 4 ties up almost twice as much money as does 2. Similarly, projects 3 and 17 promise very similar net rewards, but in the case of project 3, funds are tied up for five years; in project 17, the return is achieved in one year and the funds are freed for other purposes in the second and third years. All that can be said is that all four are worth doing.

Table 11

MEASURES OF ADVANTAGE

Project Number	Years Held	Purchase Price ($000)	At 3.5 Percent Interest			At 6 Percent Interest		
			Net Benefit ($000)	Benefit Cost Ratio	Net Rate of Return [a] Percent	Net Benefit ($000)	Benefit Cost Ratio	Net Rate of Return [a] Percent
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	7	46.7	116.5	8.5	41	90.7	5.4	35
2	5	38.1	65.2	8.4	38	53.4	5.4	33
3	5	80.1	50.5	4.0	14	35.5	2.5	10
4	5	67.4	77.3	5.9	25	60.7	3.8	22
5	5	62.0	190.0	13.0	68	161.2	8.5	62
6	4	92.0	88.7	7.2	26	71.5	4.3	22
7	4	101.6	68.3	5.3	19	52.5	3.2	15
8	3	70.9	17.4	2.8	9	11.1	1.8	6
9	2	24.7	14.2	7.2	30	12.4	4.7	28
10	2	229.1	14.0	1.8	3	2.7	1.1	1
11	2	221.6	—17.2	0.1	—4	—26.7	0.1	—7
12	2	194.4	24.8	2.4	7	14.7	1.6	4
13	2	68.3	17.4	4.0	13	13.4	2.6	11
14	2	228.5	20.1	2.0	5	8.6	1.3	2
15	1	151.5	40.5	7.4	28	35.9	4.9	25
16	1	60.7	14.7	5.8	25	13.0	4.0	23
17	1	93.2	50.2	11.8	56	46.9	8.0	53
Total		1,830.1	852.6			657.5		
Average		107.7	50.2	5.7	24	38.7	3.7	20

[a] Net rate after all costs including interest, see text.

If they could not all be undertaken (that is, under capital rationing), these differences in the size and duration of the investment necessary to earn a given reward need to be taken into account. A rough way to do so is to calculate the ratio of benefits to costs. The major costs are interest and taxes foregone, and these are related to the size of the capital investment. As a result, benefits divided by costs (column 4 of the table) are bound to show a higher ratio for project 2 than for project 4 (8.4 and 5.9 respectively), and likewise for project 17 than for 3 (11.8 and 4.0 respectively). Columns 4 and 7 of the table give the ratios for each project at the 3.5 percent and 6 percent interest rates. Incidentally, their rank position is virtually the same regardless of whether the cost of capital is calculated at the borrowing rate or at the higher figure.[8]

Ranking the school site purchases in terms of the benefit-cost ratio answers the problem of recognizing the implications of the size and duration of the investment. However, it still is a somewhat awkward notion. True, it is useful to know that benefits are four times costs; nevertheless, the statement is ambiguous. For one thing, definitions are shifty, because the size of either benefits or costs depends on the details of the accounting methods that are used—for example, income from rent could have been counted as a negative carrying cost offsetting interest.

For this reason, then, we propose a transposition of the net benefit to a figure of net annual return on capital after all costs, including interest, have been covered. The annual return can be read from standard mathematical tables giving the annuity that yields a specified present value—that of the net benefit. This annual return is divided by the purchase price to find the annual net rate of return. The figures for annual net rate of return are shown in columns 5 and 8. Projects 2 and 7 earn 38 percent and 19 percent per year on funds invested in advance purchase, after all costs including interest at 3½ percent. An interest rate of 6 percent (column 8) cuts down the net yield to 33 and 15 percent respectively.

The annual rate of return after all costs seems to be a meaningful gauge of achievement. It is interesting, incidentally, that it gives virtually the identical rank order for the 17 projects as does the benefit-cost ratio. However, the similarity is due to the fact that costs have an almost identical structure for all projects. Were the structure to differ among projects, the two measures would give a different rating. Among different government programs, since cost structures are likely to differ, return after costs seems to provide a basis of comparison preferable to that of net benefits or a benefit-cost ratio. At the same time, it has the advantage of easy calculation as an adjunct to the estimation of net benefit. It is still important to know the value of total measurable benefits and costs so that intangible benefits and costs, which also tend to be bulk quantitites, can be compared with them. Consequently, the basic form of the cost-benefit analysis needs to be preserved.[9]

REASONS FOR THE SUCCESS OF THE PROGRAM

Since substantial programs of advance land acquisition are uncommon, it is necessary to explain the existence as well as the effectiveness of the program in Montgomery County. Of course, the development of the planning and acquisition procedures which have been described was not

8. We pointed out in Chapter 5 that this tended to be the case for projects whose general time-patterns of costs and benefits were similar.

9. The return after all costs has a form similar to an earnings rate or "internal rate of return"—the discount rate that equates the present value of benefits with that of costs. This rate cannot be calculated by means of a transformation of net benefit, but requires a somewhat awkward set of experimental calculations. It has the further disadvantage of applying different time discounts to more profitable than to less profitable alternatives. The subject is elaborately debated in most texts on managerial economics. For an excellent discussion of the subject in the context of government decision-making see *Efficiency in Governments Through Systems Analysis* by Roland N. McKean (New York, 1958), Chapters 5 and 7.

an overnight process, and it was several years before the present smoothly operating working arrangements were evolved.

Three factors responsible for the success of the advance acquisition program stand out.

First, the political climate was favorable. Montgomery County has a "school minded" population, and it is reputed to have one of the finest public school systems in the country. In 1965, 73 percent of all county expenditures were for education. There is effective political pressure in the County for good performance, and when school enrollment is growing fast, good performance means planning ahead.

Second, the environment was favorable. With the strong upward trend of land values in the developing areas of the County, it is hard to make a mistake about price by buying land in advance. The impressive appreciation in value of the sites held for future use has enabled the program to show large dollar benefits. Also, with the fast upward trend in school population of about 5,000 new students a year, it is hard to make a mistake about the need for new schools in the future.

Third, the institutional framework was favorable. It seems clear that economies of scale are present in the operation of the program. A single Board of Education is responsible for the whole County (493 square miles), and in its planning arrangements it deals with other agencies which are also responsible for the whole County. If the area had been divided into a number of separate school districts, no one of them would have had the incentive or resources to assess the broad problem of suburban growth or to develop the techniques required to prepare for it. But, as one authority responsible for all of Montgomery County, the Board of Education has been able to benefit from the continuing experience of growth and has been able to develop an appropriate response. The growing edge of the urban area has not been left in limbo, waiting until after the growth occurs before effective authority is exercised.

Chapter 8

ADVANCE ACQUISITION PROGRAM IN RICHMOND, VIRGINIA

Richmond, in contrast to Montgomery County, is an old city which is densely populated as the result of a long history of continuous growth. In the 1950 to 1960 decade, the city experienced its first population decline (4.5 percent), although the metropolitan area of which it is the core city continued to grow rapidly. But the recent population decline in Richmond itself is expected to level or reverse, since the city continues to have a dynamic and diversified economy. It is the state capital, an important educational and financial center, and one of the chief regional centers of the South.[1]

ORIGIN OF THE ADVANCE LAND ACQUISITION PROGRAM

Richmond's advance land acquisition program originated in the late 1940's, during a period of marked change in the structure of its municipal government.

1. For Richmond population data see U. S. Bureau of the Census, *Census of Population*, 1910 to 1960. For population forecasts and data on the economic composition of the area and analysis of economic and employment trends see Richmond, City Planning Commission. *Master Plan of Land Use, Community Facilities and Trafficways*, 1964 (adopted and approved 1965), and *A Master Plan for the Physical Department of the City*, 1946; and *Richmond Community Renewal Program*, 1966, prepared by the City and the Richmond Redevelopment and Housing Authority.

The most important event of this reorganization period was the establishment of the council-manager form of government in 1948. Throughout the long campaign for change in the form of government and the period of charter preparation, widespread citizen interest and activity played a prominent role, and there developed a general receptiveness to new ideas and innovations.

The first step towards a policy of advance land acquisition was the adoption in 1946 of Richmond's first master plan, the *Master Plan for the Physical Development of the City.* The plan was a twenty-year projection of the growth of the city, and it set forth the location of many future capital improvements projects. This plan (and subsequent revisions) became the foundation of Richmond's advance land acquisition program by supplying an essential ingredient: information on what sites would in the future be needed for public use.[2]

The second step was the enactment in 1949 of a City Ordinance which set up procedures for the city to acquire any property on which new private construction was contemplated if the property was one designated in the master plan for some future public use.[3] This ordinance was designed to block any new private construction on sites scheduled for later acquisition by the city, and envisioned advance acquisition only in situations where it would be necessary to forestall such new construction.

The third step in creating the advance acquisition program as it exists today was the establishment in 1951 of a City Real Estate Agency. Prior to that time the responsibility for acquisition and management of city real estate was scattered among a number of departments, and information on properties already owned by the city was not readily available. The new agency was formed, with the strong support of the City Manager, to bring together all city real estate functions into a single administrative agency. One of its initial duties was "to formulate, in cooperation with the city planning commission a long-range plan for the acquisition of property required for the future needs of the city."[4]

OPERATION OF THE PROGRAM

Richmond's advance land acquisition program is centered on the master plan and the building permit application procedure.

Building Permit Application Procedure

The process by which a future site is acquired starts with the Commissioner of Buildings, who among other things is responsible for the review of all building plans to assure conformance with appropriate regulations and the issuance of permits for new construction and structural alterations.

The 1949 Ordinance requires that the City Planning Commission file a copy of the master plan and all amendments thereto with the Buildings Commissioner. In considering applications for building permits in excess of $1,000, the Buildings Commissioner is required to determine whether the property involved in the application has been designated in the master plan as needed for future public use. If it is so determined, the Commissioner is required to notify the Director of City Planning, and to delay any action on the permit application for thirty days. Little in the way of new improvements or alterations of designated properties can be undertaken without bringing the provisions of this ordinance to bear. Affected are all applications for building permits "to erect, construct, add to, enlarge, alter, repair, move, convert, or extend any build-

2. Richmond is currently operating under its second plan, *Master Plan of Land Use, Community Facilities and Trafficways,* 1964 (adopted and approved 1965).

3. Richmond City Ordinance No. 49–8–24, adopted March 14, 1949, amended by Ordinance No. 50–13–20, adopted 1950.

4. Memorandum from the City Manager to the Richmond City Council, dated May 3, 1951. This memorandum reviews the early efforts to establish a city real estate agency.

ing, structure or sign, the estimated cost of which shall exceed $1,000 . . ." if they involve property which ". . . is set apart in the master plan or in any other plan implementing or executing the master plan for acquisition by the city."[5]

Role of the Planning Staff and the City Estate Agent

The planning staff plays the most decisive role in the process of advance acquisition, although its recommendations are subject to review and approval by the City Planning Commission and finally by the City Council. When the Director of Planning is informed that an application for new construction is pending on a property identified in the master plan for possible future public use, he must make a decision as to whether the city should then purchase the property in order to prevent the construction. This decision turns largely on whether an alternative site suitable for the planned public facility would still be available if the property under consideration were built on.

If the property is located in the path that has been set for a future street widening or expressway project, the property is clearly scheduled for eventual acquisition by the city (unless the plan is changed), and the decision in this case is almost always to acquire the property in advance. Exceptions are usually made only when the cost of the improvement is relatively small in proportion to the purchase price and when the date of expected use is not close.

For some future facilities, however, only the general location has been set, and the planning staff must exercise its discretion in recommending acquisition. The new master plan, adopted in 1965, shows the location for many planned facilities, including parks, schools, libraries, fire stations and highways, and for some of these there is more than one possible site. In these cases, only the general location for the facility is shown in the plan, but the planning staff keeps a record, usually confidential, of the several possible sites. If a building permit is applied for on one of these sites, the planning staff must examine the alternatives still available to see if the property in question would be the best site for the purpose. If it is, the staff would recommend its acquisition, but if an equally suitable alternative site is still available, the Director of Planning would notify the Buildings Commissioner that the property is not needed, and the building permit application is then processed with the ordinary procedures.

In practice, few of the properties considered in the building permit review procedure fall into the category of sites that require the planning staff to reexamine in detail the alternatives available. Most of the sites located in the master plan have been precisely identified in special studies undertaken with the cooperation of the operating departments; many are for street widenings or highways, which are determined long in advance, and many others are for the expansion of existing facilities, such as schools, parks, and cemeteries, about which there is also little doubt as to location. Only for new facilities on new locations is there much flexibility in location, and in a built-up city like Richmond, these are in the minority. However, the planning staff does make a review of the factors which dictated the initial decision, and reevaluates this decision in light of any unforeseen changes which might have occurred in the meantime.

In its consideration of the acquisition, the planning staff often requests an appraisal of the property from the City Real Estate Agent. His advice is also required when there is some doubt as to whether the building permit has been applied for simply in order to force the city to purchase the property. When there is some doubt about whether or not the application is genuine, the City Real Estate Agent (who has had 32 years of experience in the real estate business) considers the real estate market in the area of the site, the financial resources of the owners, and other relevant factors, and if he believes that the application is not genuine, he advises the planning staff

5. Richmond City Code, Chapter 38, Article I, Section 7.

to take a calculated risk and let the building permit application go through. Even after this weeding out process, the planning staff estimated that perhaps 25 percent of the acquisitions were properties where the permit application did not signify a genuine intent to build.

Role of the Planning Commission and the City Council

The Director of Planning has the responsibility of recommending a course of action to the City Planning Commission. If he does not recommend acquisition of the property in question, the building permit application is not delayed further. However, if he does recommend acquisition, the application is delayed another 30 days for the Planning Commission to act. The Commission, it is reported, usually though not inevitably follows the recommendation of its professional staff.

If the Planning Commission approves the acquisition, the building permit application is delayed a further 30 days to give the City Council time to consider the acquisition. Any acquisition of property by Richmond must be finally approved by the City Council. The Council considers the recommendation of the Planning Commission and the property appraisal and recommendation made by the City Real Estate Agent. It has almost always authorized the recommended acquisition.

When the Council decides in favor of acquisition, it passes ordinance declaring that "a public necessity exists" for the purpose shown in the official plan of the city, and that "the public necessity requires the acquisition" by the city of the particular property in question. This constitutes merely a declaration of interest, and empowers the City Real Estate Agent to negotiate for the property. The city attorney is responsible for carrying through the legal duties in concluding the acquisition. A second Council resolution, stipulating the price and conditions of purchase, is required for final approval and purchase.

So far, there has been no challenge to the legality of the program, even though some properties have been acquired more than 10 years in advance of need.

Scope of the Program

Data on advance land acquisitions are not complied in any systematic way. Information is available on the total number of acquisitions for both immediate and advance use that are made in any one year, and on the total funds committed for such purchases, but the record does not distinguish between acquisition for current and future use. To obtain this breakdown would require an exhaustive review of each acquisition with the assistance of a knowledgeable official. Such an effort was not possible for the purposes of this study.

The amount of land acquired for public purposes, whether for present or future use, is indicated in Table 12.

Table 12

NUMBER OF ACQUISITIONS AND FUNDS EXPENDED, 1960-1965

Year	Number of Acquisitions	Funds Expended
1960-61	108	$ 982,000
1961-62	32	600,000
1962-63	91	972,000
1963-64	81	395,000
1964-65	74	576,000
Total	386	$3,525,000

Source: *Annual Reports*, Division of Real Estate Management.

The City Real Estate Agent and the planning staff made a rough estimate that 150 properties have been acquired in advance of need since the start of the building permit review procedure, and that 100 of these have been acquired five or more years in advance of need.

Richmond also purchases sites after projects have been set up in the Capital Improvement Program. Most of such purchases are for immediate use, but some can be classified as in advance of need. The practice of establishing a capital project with planning, site purchase, and development funds budgeted several years in advance of the construction funds is not uncommon. Such acquisitions would tend to be for a relatively

shorter period in advance of need than the average for those purchased under the building permit review procedure. It was not possible to estimate the scope of purchases falling within this category but the officials concerned with land purchase reported that it was considerable.

In addition, other properties scheduled for future use are occasionally acquired in advance of need when the owner offers them for sale to the city. Such purchases do not occur often and are almost certain to be small properties with modest purchase prices. Conditions for purchase normally would require a definite site location and an absence of any suitable alternative sites.

Funds for advance acquisition are drawn from a project's capital budget, if one has been set up, or from a special Land Acquisition Account if the project has not yet been included in the capital budget. Funds appropriated to the Land Acquisition Account since 1951 have averaged $354,000 per year, and $300,000 per year is budgeted for the next five years. However, not all of the funds in the Land Acquisition Account are used for advance acquisition; the account is also used where usual or unanticipated demands for currently needed land occur; the amounts for current and future acquisitions are not segregated.

Unfortunately, these figures provide only a hazy notion of the amount acquired in advance. There is some evidence to suggest that the figure could be as much as a third of the total. In any event, the estimate of 150 cases of advance purchase is itself an indication that this is one of the larger city programs in the country, at least in terms of number of cases.

EVALUATION OF COSTS AND BENEFITS

A sample of 21 properties was selected for analysis from the files of the Real Estate Division. Most of the acquisitions in the sample were for two projects. One is an expressway which is planned for 1969 (12 acquisitions) and the other a street widening planned for 1972 (6 acquisitions). The other

Table 13
RAW DATA FOR COST-BENEFIT CALCULATIONS

Year Bought	Target Date	Purchase Price	Estimated Value		Improvements, Cost Estimate	Rentals, Annual
			In 1966 [a]	At Target Date [b]		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Acquisition for Expressway						
1961	1969	$ 3,000	$ 3,500	$ 3,800	$ 15,000	$ —
1961	1969	2,200	4,800	5,200	36,000	—
1962	1969	1,000	1,650	1,800	13,500	—
1962	1969	1,300	2,000	2,200	12,500	—
1962	1969	1,100	NA	1,400	6,700	—
1963	1969	3,000	4,200	4,600	19,900	—
1963	1969	800	1,500	1,600	—	
1964	1969	1,400	1,500	1,600	7,500	—
1965	1969	2,800	3,200	3,500	10,000	—
1965	1969	27,800	30,000	32,800	75,000	—
1965	1969	25,000	25,000	27,300	30,000	—
1965	1969	27,800	NA	31,200	250,000	—
Acquisition for Street Widening						
1961	1972	13,600	13,600	16,200	70,000	100
1961	1972	27,500	28,000	33,400	35,000	940
1962	1972	25,000	NA	33,600	35,000	—
1963	1972	32,000	37,500	44,800	150,000	1,800
1964	1972	36,000	36,000	43,000	35,000	—
1965	1972	35,000	35,000	41,800	415,000	600
Acquisition for School Additions						
1964	1972	4,400	NA	5,700	—	—
1964	1972	4,500	NA	5,700	—	—
1965	1971	45,000	45,000	51,100	8,000	3,000

[a] Estimated by the City Real Estate Agent.

[b] Assuming appreciation 1966 to target date at 3 percent per year, compounded annually; e.g., (for line 1) 1966 value of $3,500 × 1.093 = $3,826, the estimated 1969 value; for the properties for which 1966 estimates were not available, we assumed 3 percent appreciation over the entire holding period. For the basis of selecting the 3 percent rate, see text below.

three acquisitions were for school projects scheduled in 1971 and 1972.

Information was obtained for each site on: the date of purchase and the date of expected use, the purchase price, the assessed value at time of purchase, the estimated 1966 value, rents received from temporary use, the purpose of the building permit application, and the estimated cost of the projected improvement on the site. The City Real Estate Agent made a rough estimate of the current value of the property in 1966. The data are shown for each property in Table 13.

As in the Montgomery County study, the dollar-measurable costs and benefits are first calculated and compared, and then the important intangible costs and benefits are described. However, rather than show all the calculations for each benefit and cost for each property, as done in Chapter 7, we shall instead merely refer back to Chapter 7 for the methods used. The data for each acquisition will be shown only in Summary Tables 14 and 15, giving the present values of major costs and benefits.

Measurable Benefits

The measured benefits in the Richmond program have been (a) appreciation in value of the sites purchased, (b) the rental return on temporary use and, most important, (c) avoidance of the cost of buying and demolishing newly constructed improvements at the target date for public use.

Appreciation. Estimates of 1966 market value of the 21 properties were made by the City Real Estate Agent. The median rate of appreciation from purchase date to 1966 for the 21 properties was about 6 percent per year.

An estimate of the value of the properties at target date requires an assumption about the further appreciation that will occur between 1966 and the target date of use. A conservative one was selected—that the properties will experience further appreciation at a rate of 3 percent per year until the target date, half the median rate of appreciation that has been experienced so far. It also seems conservative in light of the fact that the assessed value of all taxable land in Richmond rose at a rate of 6 percent per year between 1955 and 1966,[6] a period during which the ratio of assessed value to market value has remained stable.[7]

After the value at target date is estimated (see Table 13, column 5) the estimated appreciation between acquisition and the target date is found, and the present value of this appreciation at the date of acquisition is calculated at two discount rates: the municipal bond rate of 3 percent, and the higher 6 percent rate for purposes of comparison. The computations were performed as in Table 4 of Chapter 7. The present value of appreciation for each property is shown in Table 14, Column 2, for a 3 percent discount rate and in Table 15, Column 2, for a 6 per-discount rate.

Return on temporary use. As of January 1966, 37 properties purchased by the city for some future public use were being rented.[8] Some of these rents are only a nominal $1.00 per year charged certain educational or philanthropic organizations. Also, some properties acquired in advance are used in the interim for some municipal functions at no fixed rent. Therefore, the actual benefits to the community of the temporary use are underestimated by the dollar figures. For the 21 properties in the sample, rents are collected on 6. None of the 12 properties acquired for the expressway are rented because they are in a decaying part of town and the properties are shabby. However, 4 of the 6 street-widening properties are rented.

The computation of present value at date of acquisition of rental income was performed as in Table 5 of Chapter 7. The results for each acquisition are shown in Column 4 of Tables 14 and 15 (for the 3 percent and 6 percent discount rates).

Avoiding the cost of purchasing and demolishing new construction. The chief ecoomic benefit of Richmond's advance land acquisition comes from avoiding the need to

6. Information supplied by Richmond Assessor of Real Estate.
7. Richmond Assessor of Real Estate, *Annual Report*, 1964–1965.
8. Report of the City Manager to the City Council, January 1, 1966, on city real estate transactions.

purchase and demolish recently constructed improvements when land is needed for public use. A rough but conservative estimate of the purchase cost saved by forestalling new improvements is based on the estimated cost of the new construction for which permits were requested. A construction cost estimate is required in each building permit application, and this information is shown in Column 6 of Table 13.

The present value of this benefit is found by discounting the savings in purchase cost from the target date back to the date of acquisition. The results for each property are shown in Column 3 of Tables 14 and 15.

Naturally, this benefit does not materialize if at the target date it turns out that the property is not used for any public purpose. If plans change and the property is later sold, the city will in the interim have maintained its option to use the site, but will not finally realize the benefit of having avoided new construction on it. There is now some doubt as to whether the expressway route for which 12 of the sites in the sample were acquired will actually be used. The possible effect of this eventuality on the evaluation of the costs and benefits is taken up in the discussion of the Summary Tables. There seems little doubt that the 9 sites in the sample acquired for purposes other than the expressway will be used, and since the locations of the sites necessary for the street widening and school additions are so definite, there is almost no possibility of alternative sites.

Even when a site acquired in advance is used, the apparent benefit of avoiding the cost of purchasing and demolishing new construction is not real if the permit application does not signify a genuine application to build, or if a suitable alternative site is available at the target date. In calculating the benefit of avoiding new improvements, the effect of the bogus permit applications can be taken into account in a rough way by assuming that some percentage of the new improvements applied for would not have been built even if the property had not been acquired in advance. The planning staff's estimate of 25 percent is used for this in the discussion of the Summary Tables.

The benefit of avoiding the cost of demolishing new improvements at the target date is more difficult to estimate, and we have not attempted to do it here. One reason for not doing this is that many permit applications are for replacement or repair of existing structures, and the cost of demolishing the new improvement may not be much higher than the cost of demolishing the existing structure. If the new improvement were to be put on vacant land, the demolition cost would be more important, but probably still small in relation to the purchase price.

Measurable Costs

Cost of capital. Following the discussion in Chapters 5 and 7, we have used Richmond's borrowing rate to represent the interest cost on funds invested in advance land acquisition. The rates applicable to Richmond General Obligation Bonds have been calculated for the years 1960–1965.[9] They averaged 3.14 percent, and approximately this figure, 3 percent, is used to discount costs and benefits. As in Chapter 7, we illustrate the implication of a higher interest rate by making the calculation of costs and benefits at an alternative rate of 6 percent.

The interest payments on the purchase price for each site have been calculated at both 3 and 6 percent. The present value of the stream of payments over the holding period from date of acquisition to target date is shown for each site in Column 6 of Tables 14 and 15. The computation was performed as in Table 6 of Chapter 7.

Property taxes foregone. Richmond is required by state law and city ordinance to assess property at full market value, and recent assessment ratio studies have shown that this is reasonably maintained. Between 1960 and 1965 the ratio of assessed value to sales price of properties sold has varied between 92 and 105 percent.[10] Therefore, we

9. Moody's Ratings for Richmond General Obligations were obtained from *Moody's Municipal and Government Manual*, Moody's Investor's Service, New York, N.Y., February 1966. The interest rate for each year was taken as Moody's Average Bond Yield for the credit rating assigned to Richmond.

10. Assessor of Real Estate, *Annual Report*, 1964–65. Richmond, Virginia.

have assumed that the assessment is the same as the estimated value for each property, and have calculated the tax loss of the base. In Richmond, the tax rate on all taxable property is $1.84 per $100 of assessed valuation. As in Chapter 7, we have used the tax on the average assessment over the holding period to represent the stream of lost taxes on each property acquired.

However, in the present case the taxes lost on improvements that would have been made if the properties had remained in private hands must also be considered. To do this we have assumed that if the property had not been acquired the construction proposed in the building permit would have been carried out and the new improvement would have entered the tax rolls two years after the permit was applied for. Therefore, we have calculated the tax loss on the basis of an assessed value for the new improvement equal to the construction cost estimate, and for a period of two years less than the full holding period. The taxes lost on the existing property and on the prevented new improvements are shown in Columns 7 and 8 of Tables 14 and 15. The computation was performed as in Table 7 of Chapter 7.

The figures for foregone taxes probably overestimate the loss to the city for three reasons: (1) they do not take into account the fact that requirements for city services are also somewhat reduced when there are fewer new improvements. However, this saving would probably not be large, and it has not been possible to estimate it; (2) some of the improvements would probably not have been made if the properties had not been acquired. Again, the planning staff's estimate that 25 percent of the applications are not genuine can be used to indicate the amount by which the figure for the lost taxes on improvements should be reduced; (3) some of the new improvements may not actually have been blocked, but merely diverted onto other sites. The importance of this factor is difficult to state. Presumably, if there existed a demand for the services of these buildings, this demand might have been met by similar construction elsewhere in the vicinity.

Despite the difficulties of estimation, these three possibilities indicate that the estimate of taxes lost on new improvements is a liberal one.

Administrative costs of operating the program. The City Planning Staff and the Division of Real Estate undertake most of the work of the advance acquisition program. Both agencies felt that this program was such a small part of their duties that their operating expenses would not be noticeably lower if the program did not exist. For most acquisition the work is asimple routine. A precise estimate of the cost would be difficult to make and somewhat unreliable. In any case, the cost per acquisition would certainly be very small, and therefore it has not been included in the calculations.

Comparison of Measurable Costs and Benefits

For each acquisition the measurable costs and benefits have now been estimated and discounted back to the date of acquisition. The results are displayed in Table 14 (using the 3 percent discount rate) and in Table 15 (using the 6 percent rate).

If all the properties are actually used at the target dates, and if all the permit applications were genuine, the *average net benefit* per acquisition is $43,200 at the 3 percent discount rate and $32,600 at the 6 percent rate. If we assume that 25 percent of the permit applications were bogus, the average net benefit is reduced to $32,500 and $24,000 at 3 percent and 6 percent, respectively.[11] Most of the benefits of the program clearly come from avoiding the construction of new improvements that would later have to be purchased and demolished: 90.5 percent of the total benefit is due to this one cause, at either discount rate.

Even on the most pessimistic assumptions that the expressway sites are not used, that 25 percent of the permit applications were not genuine, that none of the new improvements was diverted to an alternate site, and that the interest rate is 6 percent, the net benefit is still $227,000 and the benefit cost

11. This figure is found by reducing both the benefit of preventing construction and the cost of lost taxes on new improvements by 25 percent. All other costs and benefits remain the same.

ratio is 2.1 for the 21 acquisitions in the sample.[12]

The results on a project-by-project basis are also interesting. For the expressway project, the estimated net benefit is $327,600 at the 6 percent rate. If we assume that 25 percent of the permit applications were bogus, the net benefit is reduced to $242,600. If the expressway sites are eventually not used and if 25 percent of the permit applications were bogus, the result would be a net cost of $29,500 for holding the twelve properties. In this case, the net measured cost would have to be set against the intangible benefits to arrive at a judgment.

For the street widening, the net benefit of the six acquisitions is $352,800 at the 6 percent rate. If 25 percent of the permit applications are false, the net benefit is reduced to $254,900. The only acquisitions that fail to show a net benefit are two of the school sites. Since there was no building permit included in these two acquisitions, appreciation is the only benefit.

Table 16 displays for each acquisition the three measures of advantage that were discussed in Chapter 7; the net benefit, the benefit-cost ratio, and the net rate of return on capital after all costs, including interest, have been covered. Even when the interest

12. This figure is found by deducting the entire benefit of preventing construction on the freeway sites and 25 percent of the benefit of preventing construction on other sites, and also deducting 25 percent of the cost of lost taxes on new improvements on all sites, all calculated at the 6 percent interest rate.

Table 14

SUMMARY OF COST AND BENEFITS, PRESENT VALUE
INTEREST AT 3 PERCENT

(Thousands of Dollars)

	Benefits				Costs				
						Taxes Foregone			
Years Held	Appreciation	Prevented Construction	Rents	Total [a]	Interest	Property	Improv'ts	Total [a]	Net Benefit [a]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Acquisition for Expressway									
8	0.7	11.8	—	12.5	0.6	0.4	1.5	2.5	10.0
8	2.4	28.4	—	30.8	0.5	0.5	3.5	4.4	26.4
7	0.7	11.0	—	11.7	0.2	0.2	1.1	1.4	10.2
7	0.8	10.2	—	10.9	0.2	0.2	1.0	1.5	9.5
7	0.2	5.4	—	5.7	0.2	0.1	0.6	0.9	4.8
6	1.3	16.7	—	18.0	0.5	0.4	1.3	2.2	15.8
6	0.7	—	—	0.7	0.1	0.1	—	0.2	0.5
5	0.2	6.5	—	6.7	0.2	0.1	0.4	0.7	6.0
4	0.6	8.9	—	9.5	0.3	0.2	0.3	0.9	8.6
4	4.5	66.6	—	71.1	3.1	2.0	2.6	7.7	63.4
4	2.1	26.6	—	28.7	2.8	1.8	1.0	5.6	23.1
4	3.1	222.0	—	225.1	3.1	2.0	8.6	13.7	211.4
Sub-Total	17.3	414.1	—	431.4	11.8	8.0	21.9	40.9	390.5
Acquisition for Street Widening									
11	1.9	50.5	0.9	53.4	3.7	2.5	9.8	16.0	37.3
11	4.3	25.3	8.7	38.2	7.6	5.1	4.9	17.6	20.6
10	6.4	26.0	—	32.4	6.4	4.5	4.4	15.3	17.1
9	9.8	114.9	14.0	138.7	7.5	5.4	16.8	29.7	109.0
8	5.5	27.6	—	33.1	7.6	5.0	3.4	16.0	17.1
7	5.5	337.4	3.7	346.6	6.5	4.3	34.2	45.1	301.6
Sub-Total	33.4	581.7	27.3	642.4	39.3	26.8	73.5	139.7	502.7
Acquisition for School Additions									
8	0.9	—	—	0.9	0.9	0.6	—	1.5	—0.6
8	0.9	—	—	0.9	0.9	0.6	—	1.6	—0.6
6	6.0	6.7	16.3	28.9	28.9	4.7	0.5	12.6	16.4
Sub-Total	7.8	6.7	16.3	30.7	9.1	5.9	0.5	15.7	15.2
TOTAL	58.5	1,002.5	43.6	1,104.5	60.2	40.7	95.5	197.1	907.6
Average	2.8	47.7	2.1	52.6	2.9	1.9	4.6	9.4	43.2

[a] Figures may not add precisely because of rounding.

cost is charged at the higher 6 percent rate, the net rate of return on capital is substantial for most of the acquisitions: 14 show a net rate of return above 20 percent per year, and only two show a negative return.

It should be pointed out, however, that these high rates of return do not necessarily indicate that Richmond has been neglecting acquisitions that would show a lesser, but still positive, return. Rather, it reflects the fact that when new construction is prevented on a site scheduled for future public use, the benefit is great. When all such sites are automatically acquired, there may be very few other instances, in a city like Richmond, where advance land acquisition would be clearly favorable.

The measured results of the sample of acquisitions have been good. However, they must be weighed against the intangible costs and benefits to see if the net result is still favorable.

Intangible Costs

Risk of acquiring unneeded sites. The most important unmeasured cost of the program is the risk of acquiring sites that will turn out to be not actually needed. The financial results of acquiring sites later not needed is mitigated for the city by the fact that the city has authority to sell any land it has acquired in advance of needs which do not materialize. The city may even make a pro-

Table 15

SUMMARY OF COSTS AND BENEFITS, PRESENT VALUE
INTEREST AT 6 PERCENT

(Thousands of Dollars)

	Benefits				Costs				
						Taxes Foregone			
Years Held	Appreciation	Prevented Construction	Rents	Total [a]	Interest	Property	Improv'ts	Total [a]	Net Benefit [a]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Acquisition for Expressway									
8	0.5	9.4	—	9.9	1.1	0.4	1.3	2.8	7.1
8	1.9	22.6	—	24.5	0.8	0.4	3.2	4.4	20.1
7	0.6	9.0	—	9.5	0.3	0.1	1.0	1.5	8.1
7	0.6	8.3	—	8.9	0.4	0.2	0.9	1.5	7.4
7	0.2	4.5	—	4.6	0.4	0.1	0.5	1.0	3.6
6	1.1	14.0	—	15.2	0.9	0.3	1.2	2.5	12.7
6	0.6	—	—	0.6	0.2	0.1	—	0.3	0.2
5	0.2	5.6	—	5.8	0.3	0.1	0.4	0.8	5.0
4	0.6	7.9	—	8.5	0.6	0.2	0.3	1.1	7.4
4	4.0	59.4	—	63.4	5.8	1.9	2.5	10.1	53.3
4	1.8	23.8	—	25.6	5.2	1.6	1.0	7.8	17.8
4	2.8	198.0	—	200.8	5.8	1.8	8.2	15.9	184.9
Sub-Total	14.9	362.5	—	377.3	21.8	7.2	20.5	49.7	327.6
Acquisition for Street Widening									
11	1.4	36.9	0.8	39.1	6.4	2.1	8.6	17.1	21.9
11	3.1	18.4	7.4	29.0	13.0	4.3	4.3	21.6	7.4
10	4.8	19.5	—	24.3	11.0	3.9	3.9	18.8	5.5
9	7.6	88.8	12.2	108.6	13.1	4.7	15.1	32.8	75.8
8	4.4	21.9	—	26.3	13.4	4.4	3.1	20.9	5.4
7	4.5	276.0	3.3	283.8	11.7	3.9	31.4	47.0	236.8
Sub-Total	25.8	461.5	23.7	511.1	68.6	23.3	66.4	158.2	352.8
Acquisition for School Additions									
8	0.7	—	—	0.7	1.6	0.6	—	2.2	—1.4
8	0.8	—	—	0.8	1.7	0.6	—	2.2	—1.5
6	5.0	5.6	14.8	25.4	13.3	4.3	0.5	18.1	7.3
Sub-Total	6.5	5.6	14.8	26.9	16.6	5.5	0.5	22.5	4.4
TOTAL	47.2	829.6	38.5	915.3	107.0	36.0	87.4	228.9	686.3
Average	2.2	39.5	1.8	43.6	5.1	1.7	4.2	11.0	32.6

[a] Figures may not add precisely because of rounding.

fit on land sold if the appreciation and rental income outweigh the interest cost and lost taxes. But in the meantime the city will have unnecessarily interfered with private construction plans on the sites it has acquired. For instance, if the expressway route is relocated, the property owners along the old route will have had all plans for re-use of their property blocked for several years until the new location for the route is decided. It is difficult to say how much of a problem this is in Richmond. It is probably not very serious for the expressway route because most of the sites are in a rather depressed section of the city. In any case, the possibility of this disadvantage points up the necessity for careful planning for future needs before advance acquisition is undertaken.

Risk of encouraging bogus building permit applications. Another problem with advance land acquisition programs tied to the building permit application process is the possibility of stimulating bogus applications if a landowner thinks he can get a better price from the city than from anyone else. This risk can be reduced, as it is in Richmond, by evaluation of the applications to weed out those that seem the least likely to be carried out, but some undoubtedly do get through anyway. However, the reverse effect might also be working: some owners may not apply for building permits if they feel that the city would then step in and acquire their property. In these cases the city would achieve the benefit of avoiding new construction on some sites scheduled for future public use without actually having to acquire the property.

Intangibles Benefit

Avoiding future relocation problems. An important benefit from avoiding new con-

Table 16

MEASURES OF ADVANTAGE

Time Held	Purchase Price ($000)	At 3 Percent Interest: Net Benefit ($000)	At 3 Percent Interest: Benefit Cost Ratio	At 3 Percent Interest: Net Rate of Return [a] (percent)	At 6 Percent Interest: Net Benefit ($000)	At 6 Percent Interest: Benefit Cost Ratio	At 6 Percent Interest: Net Rate of Return [a] (percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Acquisition for Expressway							
8	3.0	10.0	4.9	47	7.1	3.5	38
8	2.2	26.4	7.0	175	20.1	5.6	151
7	1.0	10.2	8.1	173	8.1	6.5	152
7	1.3	9.5	7.5	122	7.4	5.8	106
7	1.1	4.8	6.3	70	3.6	4.6	59
6	3.0	15.8	8.2	97	12.7	6.2	86
6	0.8	0.5	2.8	11	0.2	1.7	6
5	1.4	6.0	9.6	95	5.0	7.1	86
4	2.8	8.6	11.0	83	7.4	7.7	76
4	27.8	63.4	9.2	61	53.3	6.3	56
4	25.0	23.1	5.2	25	17.8	3.3	21
4	27.8	211.4	16.5	205	184.9	12.6	192
Acquisition for Street Widening							
11	13.6	37.3	3.3	30	21.9	2.3	21
11	27.5	20.6	2.2	8	7.4	1.3	3
10	25.0	17.1	2.1	8	5.5	1.3	3
9	32.0	109.0	4.7	44	75.8	3.3	35
8	36.0	17.1	2.1	7	5.4	1.3	2
7	35.0	301.6	7.7	139	236.8	6.0	121
Acquisition for School Additions							
8	4.4	—0.6	0.6	—2	—1.4	0.5	—5
8	4.5	—0.6	0.6	—2	—1.5	0.3	—5
6	45.0	16.4	2.3	7	7.4	1.4	3
Average	15.2	43.2	5.8	67	32.6	4.2	57

[a] Net rate after all costs including interest. See text.

struction which would later have to be removed is elimination of the problem of relocating tenants from the new buildings. This forced relocation would have both a monetary and a non-monetary aspect. First, relocation payments would have to be paid to some tenants. Second, the eviction of businesses and residents from new buildings might cause enough political opposition to hamper public plans for use of the site. We have no measure of the importance of this benefit in the Richmond program.

Strengthening the planning process. Another important intangible benefit of the advance land acquisition program is the boost it has given to city planning in Richmond. The building permit review procedure ensures that plans, once made, will still be feasible at the time they are intended for execution. And the existence of the building permit review has provided a further incentive to identify the best sites for future public needs so that they will be protected in the master plan. The orderly and almost automatic process for carrying out land acquisition for projects in the master plan is a method of translating the master plan from proposal to reality, at least so far as land requirements are concerned.

Achieving some of the benefits of "excess condemnation." One unmeasured and even unintended result of this program has occurred in some of the street-widening acquisitions. Usually, only a part of an abutting property is required when a street is widened. And after the street widening has taken place, the remainder of the property usually has a higher value because of better access and the general rebuilding in the area. In Richmond it is not legal to condemn the whole property when only a part is needed for street widening, but it is legal to purchase the whole property if the owner is willing to sell. Owners have been generally willing to sell whole properties to the city

when street widening is not an immediate prospect. Thus, after the future street widenings take place, the city will be able to sell off the remainders of the parcels it acquired in advance, perhaps at a substantial profit. Though this potential benefit has not been estimated, it is possibly of great significance, and it could be measured after several street widening projects have been completed.

EVALUATION OF THE PROGRAM

The examination of both the measured and intangible costs and benefits attributable to this sample of 21 acquisitions leads to the conclusion that Richmond's advance acquisition procedure has been of great service to the city. The measured results point in the right direction even under very pessimistic assumptions about future needs, and the intangible benefits seem substantial. The intangible costs do not seem to weigh heavily.

The advance acquisition program has protected the sites for all future public facilities included in the master plan, and it has done so with a minimum expenditure of funds. The essence of the program is actually to avoid acquiring property selected for future use unless some new improvement is contemplated by the owner. Therefore, property remains in private hands so long as this does not interfere with any plans the city may have for its future use.

The operation of the program has been remarkably unobtrusive. Although it has been underway since 1949, it has received little public recognition, and no special effort has previously been made to evaluate its economic implications or its impact on the planning process. Moreover, the routines which have been set up seem to require relatively little effort in carrying out the necessary acquisitions, and yet the program seems to have been eminently successful.

Chapter 9

ADVANCE ACQUISITION AS AN IMPLEMENT OF LAND-USE CONTROL

Thus far analysis has focused on what advance land acquisition can contribute to the efficient production of the roster of services normally provided by governments.

But land serves far wider functions in a community than that of an input for government services. These broader functions—private as well as public—can be improved by advance land acquisition and other sorts of land-use controls. To deal with these questions at all adequately would require a treatise twice as long as this one. Nevertheless, at least some mention of the wide problem of advance acquisition for the purpose of improving the process of urban extension is necessary, if only to put the narrower questions on which the monograph focuses in proper perspective.

Accordingly, this chapter considers the government function of improving the usefulness to present and future generations of that scarcest resource in an urban environment, land. It is largely restricted to one technique, that of advance acquisition, and says very little about the important variety of further techniques for land-use control—zoning, mapping, subdivision control, options and the like.

The discussion starts by sketching in a somewhat impressionistic fashion some of the major advantages and disadvantages of large-scale advance acquisition of land for the purpose of improving urban extension. In the second section the discussion is illustrated by references to a few cases where some form of large-scale advance land acquisition has actually been tried.

BENEFITS FROM ADVANCE ACQUISITION AS AN INSTRUMENT OF LAND-USE CONTROL

It is necessary to think systematically about the sorts of advantages that may result from acquisition as a tool of public policy in improving land use. However, because of the broad social nature of these advantages no attempt is made to devise measures of the advantage.

Disadvantages of the usual sort—the cost of financing and taxes foregone—are of course present. In addition there may be other opportunity costs in terms of motivation, and other intangible matters in both the private and public sectors. These matters, however, are either routine or far too subtle to be dealt with except in terms of a number of new case studies.

Government Income from Land Appreciation

Capturing a rise in price of land is a benefit when the objective of advance acquisition is defined in terms of land-use controls, as well as when it is defined in terms of the sites required for specific government services. However, in the broader context of this chapter there are other aspects of the benefit from appreciation in land values or rents on acquired land that also apply.

A typically unmentioned yet often quite active reason for advocating public purchase of land is the basic notion that it is somehow improper for private individuals to make and retain "speculative" profits from land. These ideas are variously based and take various forms.

An important reason for believing that the government should receive the income from land is that rents (and increases in land values) can be tapped for revenue with less disruption to private incentives in productive processes than can income which represents a reward for effort, imagination, or risk-bearing. This is the original principle that underlies Henry George's tax theories, and it is still widely regarded as creditable.

This point of view is sometimes reinforced by a philosophy. It has long been held (and again Henry George is the best known exponent) that appreciation in the value of land rightfully belongs to the public, for it is generated by the actions of the community, rather than by those of the landowner.

This basic ethic seems to gain special force in the context of current urban land-use problems. Governments have taken on responsibility for promoting better land use and have spent vast sums upon it. In consequence, one might argue that much of the appreciation in land values belongs to the government as a result of its own actions in creating the additional value of particular parcels, as well as of broad areas, of urban land. This reason reinforces the more abstract notion of justice mentioned above. The community, in other words, is entitled to the appreciation partly because of societal behavior, but also because of the specific actions of its agent, the government, in funneling public funds into the creation of urban land value. We mention it here simply to make sure that each individual considers the question openly.

Facilitating Efficient Production of Public Services

Getting "the best site" appeared as an important reason for acquiring sites in advance of their use for schools. In large scale acquisition for urban extension, an analogous qualitative benefit is present. Indeed "getting the best sites" for community facilities actually takes on a new meaning in the context of large-scale planning and acquisition.

First, there are some things that virtually cannot be done at all if they are not done in association with advance acquisition. Waiting may result in land prices being so high that the service itself is priced out of the market, even the government market. An example might be the construction of a com-

plete lower deck to a city reserved solely for vehicles, their movement and storage.

A second example of the potential of advance acquisition to improve, if not indeed to make possible, the provision of a service is in the field of housing, particularly low income housing. A few of the many sorts of examples are mentioned below.

Third, advance acquisition on a large scale is capable also of greatly improving the efficiency with which standard governmental services such as sewage disposal, water, transport and the like are provided. The potential increase in efficiency exploits the interdependence of the location of services and the location of people to be served. Thus it makes possible, in a sense, the creation of "best sites," as well as exploitation in the public interest of the knowledge of where they will be.

An illustration of how land ownership can promote efficient provision of services is prevention of "leapfrog" development. If a new community has to leap a sitting owner who refuses to sell land adjacent to existing development, utilities have to travel longer distances. While it is impossible to generalize about the magnitude of the resultant costs, it does not seem impossible to estimate them in particular cases. For example, one recent study of a leapfrog subdivision development in Lexington, Kentucky, estimated that 40 percent of the added costs were borne by the general public, and 60 percent by the residents of the subdivision itself.[1]

It is widely recognized that this problem of scattered leapfrog development can also be meliorated by planning measures short of acquisition in full fee, particularly by zoning and subdivision controls. But an approach which seems relatively neglected is marginal cost pricing for public utilities. If builders and residents of leapfrog subdivisions were required to bear all of the added costs, this would provide an appropriate economic incentive for a more efficient pattern of urban growth and a deterrent to high-cost sprawl.[2]

Improved Community Development Planning

Urban communities intermesh with the lives of people who live in them, and who contemplate doing so, in a large number of ways—their homes, their work, play, education (and access to each), intellectual and artistic development, social contacts, personal as well as community services and so on and on. Purposive community development aims to improve and enrich aggregate community welfare in all these directions.

Government responsibility for community development harks back to the notion that better communities can be achieved by design than by the sole operation of that renowned triumvirate—the private profit motive, consumer choice, and the price system. Needless to say, a plan does not necessarily depose the triumvirate; indeed, good planning may even serve it, at the same time that anti-social "externalities" are diverted or suppressed.

Design, then, which may be very subtle or very heavy-handed, endeavors to improve development by means of a plan of some sort, and by means of an apparatus to make the plan effective. Advance land acquisition can be an important piece of that apparatus. Its role as enforcing apparatus has been illustrated in a small way earlier in this report. We saw, for example, how the acquisition of a substantial number of small sites seemed to help strengthen planning in Richmond and Montgomery County. Broad-scale advance acquisition of land and other land-use control devices could contribute even more to effective overall community planning.

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1. Roy Bahl, *A Bluegrass Leapfrog*, Lexington: Bureau of Business Research, University of Kentucky, 1963.

2: A very interesting case study of how the construction and pricing policy for new sewers and water supply has affected the pattern of development in Prince Georges and Montgomery Counties, Md., is given by Francis X. Tannian in *Water and Sewer Supply Decisions: A Case Study of the Washington Surburban Sanitary Commission*, a Ph.D. dissertation at the University of Virginia in 1965. One of the conclusions is that the sewer and water supply extension policies of the WSSC has in many cases worked directly counter to the goals of the Maryland-National Capital Park and Planning Commission, and that a change to marginal cost pricing for sewer and water supply would greatly assist the planning process.

But improved land use is also one of the central targets of planning. Land is a resource that, more than most, is subject to improved use by means of explicit and integrated government policy. For one thing, each man is subject to hurt or benefit by the use to which his neighbor puts land. For another thing, all of the interrelationships that constitute a community are affected by spatial patterns of location and movement. Control over land gives at least partial control over these spatial elements in planning.

Planning then is an intermediate step between advance acquisition and improved urban development. Further, the relationship between advance acquisition and planning runs in two directions: land purchase is an implement in the planning kit and planning is an implement in the acquisition kit. This means that benefits of advance acquisition in terms of its contribution to improved urban development interlace with the contributions of planning to the same cause.

Advance acquisition can contribute to better planning and thereby to better urban development in several ways.

First, advance acquisition has the capacity to help structure and utilize a wide variety of intra-urban relationships, functional as well as spatial. An example is its capacity to improve the calibre of transportation and utilities which are so central to an urban community. This is, as previously indicated, a benefit from advance acquisition which improves site selection, and in consequence enhances the quality and efficiency of the service generated. But there is a further benefit in the effect of these improvements on the total planning operation and the overall benefit therefrom. It is this aspect that we wish to emphasize here.

A second pervasive contribution (in which, incidentally, the two-way association with planning is strong) consists of improving the self-fulfilling capacity of expectations on which planning is based.

Third, many of the economic and political obstacles to effective planning in general, and to land-use planning in particular, are reduced by advance acquisition. Since it permits acquisition prior to solidification of vested interests, it permits planning decisions on the timing and location of new development which, if the land were owned privately, would infringe the property rights of some owners and unduly reward other owners. This has been an especially important factor in the Stockholm experience discussed below.

Timing and Scale

Each of these basic ways in which advance land acquisition can contribute to optimal urban development tends to be strengthened by the appropriate *timing* and *scale* of acquisition.

Timing. By and large, control is greater when land is acquired prior to development of any sort. This means that planning can start with a clean drawing board and determine how best to use land without paying the costs of altering previous uses. As we have seen, these costs are political as well as financial and they can be so high as to rule out a number of otherwise desirable alternatives. The proper phasing of land use is also facilitated when early acquisition provides the whole gamut of choice. Unless holding costs are disproportionately great, early acquisition is also likely to increase income from appreciation of the land.

Scale. Planning in general and advance acquisition in particular are more efficient when they are applied to areas the size of which is commensurate with the requirements of the particular problem. Thus there appears to be a minimum size necessary to planning residential development. Proper spatial relationships demand that the area be large enough to include commercial centers, schools, recreational space and the like. These individual communities in turn need to have external linkages of various sorts, e.g., to places of work and to other residential areas. Yet, as the area that is covered spreads, management and financial problems no doubt multiply. The point is simply that scale is an element in determining the advantage of advance acquisition for land-use controls, and must, therefore, be explicitly considered.

CASES OF LARGE-SCALE AQUISITION OF LAND FOR LAND-USE CONTROL

This sketchy list of possible advantages from advance land acquisition may help to structure a brief review of some interesting examples of experiments on planned urban extension.

Integral Communities or New Towns

The most ambitious form of public land acquisition to influence urban growth is the building of complete new towns. This approach has been tried more extensively in Great Britain than elsewhere. However, the land for the British new towns has generally not been acquired far in advance of construction, and thus the British experience does not illustrate how long range acquisition improves the development process, except insofar as it indicates some problems encountered that advance acquisition might have avoided.

One of the chief problems in the British program has been in selecting suitable town sites. Requirements include: that the land "not have too high agricultural value, that it can be adequately drained, that sufficient water can be produced conveniently, that road and rail connections be excellent, and that, above all, the area be attractive to industrialists."[3] Naturally, most sites answering this description are already developed. Therefore, many of the new towns have had to be planned as enlargements of existing centers, and this has created considerable difficulties, including opposition from existing local authorities and from landowners in the area.[4] The timing of acquisition, in other words, has certainly not been optimal.

However, a large number of the other obvious advantages of combining land acquisition with comprehensive planning have ensued, including substantial revenues and improved planning capability. One moot point concerns the objective of self-sufficient communities which minimize home-to-job transportation problems. Questions have been raised as to whether this has in fact materialized.

The best-known U.S. experiment in direct government participation in large-scale land acquisition for the purpose of urban development is the Greenbelt Town program carried out by the Resettlement Administration between 1935 and 1938. The primary purpose of the program was an emergency employment measure, but an additional aim was to demonstrate the advantage of large-scale city planning. Three complete communities were constructed in suburban areas near large cities: Greenbelt, near Washington; Greenhills, near Cincinnati; and Greendale, near Milwaukee. The largest of the three, Greenbelt, was built five miles from Washington on a site that included an encircling belt of park and farm land to protect against unplanned neighboring developments and to allow for future expansion.

Aside from the Greenbelt towns, there has not been in the United States much experience with large-scale public acquisition of outlying land for the purpose of planning new development. However, there have been many instances of smaller-scale acquisition of land, both public and private, and some of these serve to illustrate what advance land acquisition could contribute to the planning process.

One sort of work that involves at least temporary public land ownership is urban renewal, which has of course been an important field in this country. When large areas of a city are involved in multifaceted renewal or reconstruction, many of the elements of town planning and urban extension are present. Indeed the suggestion has been made that public bodies ought retain title to land rather than assemble it and then resell it to private parties.[5]

Though small in scale, comprehensive community planning carried out under single ownership has frequently taken place.

3. London County Council, *Planning a New Town.* London, London County Council, 1961, p. 13.

4. These problems are thoroughly described in *The British New Town Policy*, by Lloyd Rodwin, Cambridge, Harvard University Press, 1956.

5. An early proponent of the procedure is Irving D. Robbins who was responsible for a report by The City Club of New York entitled, "A Practical Program for Replanning the City of New York, The Problem, The Method, The Means." Since then, the ideas have been put into practice and also more extensively developed.

Many years ago, the National Resources Committee described 144 of these experiments.[6] They included governmentally-developed planned communities (chiefly war housing) and planned communities sponsored by industrial companies, philanthropic organizations, and real estate developers.

One example is the "company town." But only a few of these could be regarded as examples of comprehensive community planning of the sort that would be the aim of a public policy. However, a small number have been highly successful, among them Chicopee (Georgia), Hopedale (Massachusetts), and Indian Hill (Massachusetts).

Planned communities undertaken by philanthropic organizations have usually been experiments to demonstrate desirable new concepts of urban development which would be possible and profitable for private enterprises to undertake. Therefore, in these projects there has been a greater willingness to take a large risk and to depart from accepted practices in search of better ways to organize a community. Examples of this sort of new community are Radburn, New Jersey, Chatham Village in Pittsburgh, and Forest Hills Gardens, New York. Forest Hills, which was financed by the Russell Sage Foundation, is notable in that complete financial records were kept in order to evaluate the worth of the undertaking. Though the project had primarily an educational objective, it was intended to yield a reasonable return on the investment in order to set an example for purely commercial real estate developers; however, the net result was a small loss after 11 years of development and operation. Nevertheless, Forest Hills did make an important contribution to the practice of residential site planning and many of its techniques were repeated in later developments.

Private real estate organizations have also been active in developing planned communities, though few of these have until recently been on a very large scale. Naturally, the prime motive of these developments has been profit, but in many cases this has not conflicted with highly satisfactory planning. Among the most notable of these privately planned communities are Shaker Heights, Ohio; Coral Gables, Florida; Palo Verdes Estates, California; and Roland Park, Maryland.

The National Resources Committee tried to make some generalizations on the basis of the case studies. They did not attempt to formulate a balance sheet of advantages and disadvantages; however, the most important achievements were pointed out. Chief among these was the advantage of organizing the development in terms of neighborhood units, each unit with its own facilities for residence, shopping, schools, and recreation. The best results were presumably obtained when these neighborhood units were protected on their peripheries against nonconforming or incongruous use of adjacent land, and when the neighborhoods were adjacent to but not bisected by major transportation routes. These principles were found to apply regardless of whether the development authority was public or private, and some of the most successful of the communities were profit-motivated enterprises. Apparently, then, this study underscores the importance of scale in realizing the advantages inherent in planning new communities on owned land. It arrives at some specific prescriptions concerning what that scale should be.

The advantages of large-scale land development itself are more recently illustrated by the private sponsorship of the "new towns" at Reston, Virginia; Columbia, Maryland; and on the Irvine Ranch in California. These privately-planned communities closely approximate the sort of new urban development of outlying land that would be the object of a policy of outright public ownership and development, with one notable exception —the appropriate public emphasis on accommodating a cross section of society and providing low-income housing. In other respects, the correspondence between public and private interests is close and very interesting. It appears to be the result of the responsibility of a single authority for a large area over a long time, since what would be spillover effects (both of costs and benefits) for

6. U.S. National Resources Committee, *Urban Planning and Land Policies*. Washington, Government Printing Office, 1939.

smaller developments and shorter time-spans are internal to the larger area over longer time-spans. Consequently, the authority is sensitive to a range of considerations resembling the public interest at large (at least for the group of people included in the community).

In passing, it should be pointed out that a number of the advantages of large-scale development planning under single ownership can be achieved by public policies short of public land acquisition. One of the most promising of these is the promulgation of zoning ordinances designed to encourage private development of land on the scale of new towns. An example is the Montgomery County, Maryland "Town Sector Zone" ordinance which is applicable to developments of 1,500 acres or larger. The purpose of the Town Sector Zone is to assist "the building of new towns or satellite towns located far enough from the present built-up areas to permit a high degree of self-sufficiency and independent existence as a separate functioning economic and social unit."[7] To encourage development of this kind, the new ordinance "eliminates, in the Town Sector Zone, some of the specific restrictions which, in other zoning categories, regulate the height, bulk, and arrangement of buildings and the location of the various land uses." Instead, the development is judged on its overall plan, which must conform to certain standards of self-sufficiency, diversity, density, and service by transport facilities and public utilities.

Without this sort of provision, the zoning ordinances can actually deter new town development by enforcing a single form of development on large areas and by not permitting high densities in some sections to be offset by lower densities in other sections in the same development. In effect, this "new town zoning" is simply the cluster zoning on a very large and very comprehensive scale.

Another way in which public policy can encourage comprehensive planning on a large scale is to facilitate flexibility of approach in the construction of new towns. Recently, major industrial companies have announced plans to develop planned cities, and one criterion noted in the selection of sites for these new cities is the favorableness of the local government's building codes, and labor's attitude toward innovation in construction techniques. The General Electric Company is planning to build new cities of approximately 100,000 residents and has selected areas that appear receptive to the idea of some sort of "Planned Community Development Authority" which would be empowered to prescribe its own building codes and requirements.[8] This capacity to innovate is especially valuable for the larger companies that, like GE, have the resources to develop more than one new community and can take advantage of lessons learned in initial projects.

Advance Acquisition for Large Scale Urban Extension

In Europe, the experience with public land acquisition to influence the pattern of urban land use is quite different from that in the United States. While the emphasis in the United States has been on the problems of urban renewal, European countries are only now beginning to undertake this task on the scale common in the United States.[9] In Europe, however, public acquisition of outlying areas has been used to give direction to urban extension.

An excellent picture of European practices has recently been presented in the United Nations "Seminar on the Supply, Development and Allocation of Land for Housing and Related Purposes" which took place in 1965.[10] The techniques employed in the European countries are, of course, diverse, but the general approach was summed up by the con-

7. Montgomery County Zoning Ordinance, Section 104–19A.

8. "GE Proposes to Develop Planned Cities Near Major U.S. Metropolitan Centers," *Wall Street Journal*, August 18, 1966.

9. Leo Grebler, *Urban Renewal in European Countries: Its Emergence and Potentials*, Philadelphia, University of Pennsylvania Press, 1964, pp. 11–12.

10. United Nations Economic Commission for Europe, *Proceedings of the Seminar on the Supply, Development and Allocation of Land for Housing and Related Purposes*, New York, United Nations, 1965 (ST/ECE/HOU/15) Volumes 1 and 2.

ference chairman: ". . . in these countries town-planning and land price control policies are harnessed to a single principle: initiative in urban development should belong to the public authorities and not to private interests." The work reported in the conference is strongly focused on public responsibility for providing housing. To dispatch the responsibility at a reasonable cost, it is necessary to anticipate increases in land prices associated with development. In addition it seems to be assumed that private profit from speculation in land ought not to be allowed, especially since it tends to be associated with actions that forestall the use of land for the sort of housing that is of particular public concern.

The volume provides a wealth of illustrations, especially of the first and second benefits that we listed earlier—the forestalling of appreciation in land values and the more efficient provision of services (the emphasis here is on housing). Rather than summarize this material, which is readily available, we shall discuss the one experiment that provides the richest illustration of the whole range of possible benefits from large-scale advance acquisition: Stockholm.

Stockholm[11]

In 1904, the City Assembly inaugurated a policy of buying large areas of farm and forest land within a 9-mile radius of the city's center. By the late 1930's, 32 square miles of rural land had been acquired, and this included much, though by no means all, of the surrounding territory.[12] Stockholm's boundaries were extended to include this land, on which new satellite cities and garden suburbs were planned to provide for future urban expansion.

Eighteen such communities with a total population of 250,000 have since been built on the preserved land, including Hammarby, Farsta, Bjorkhagen, Vastertorp, and Vallingby. Over half the population of Stockholm now lives in suburbs which have been built on municipally-owned land.[13] The new communities are strung along subways and are separated from one another by tracts of wooded land. Some of the acquired areas were held for as long as twenty years before they were developed, and in the meantime the city was able to practice "family planning" for new development, waiting until transport and other public improvements were available before development was allowed to take place.[14]

Like the British new towns, the Stockholm centers were originally intended, at least by one group of the active proponents, to decant Stockholm residents into the suburbs on a non-commuting basis. But there appear to have been others who thought differently, since the policy of simultaneously extending the subway lines to the new subcenters made commuting to the city's center relatively easy.[15] For instance, in 1960 Vallingby provided jobs for 9,000 persons, only 2,000 of whom were residents. Seven thousand workers commute daily into Vallingby and 25,000, residents commute out, half into the center of Stockholm.

Other explicit moves on the part of public officials sometimes supported and sometimes inhibited the tendency that the subways initiated for the new communities not to be self-contained. The inconsistencies and inaction reflected a controversy between the Real Estate Director, on one side, who advocated a policy of garden suburbs with single family homes, and the Building Commissioner, on the other side, who advocated a policy of

11. A major source of the information discussed below is Institute of Public Administration, *Urban Government for Stockholm*, Frederick Praeger, Inc., New York, 1967.

12. U.S. National Resources Committee, *Urban Planning and Land Policies*, Washington, Government Printing Office, 1939, pp. 313–314.

13. Yngve Larsson, "Building a City and a Metropolis" in *Stockholm Regional and City Planning*, Stockholm, Planning Commission of the City of Stockholm, 1964, p. 19.

14. Goran Sidenbladh, "Stockholm: A Planned City," *Scientific American*, September 1965, pp. 106–118.

15. Originally the city planning authorities, who developed the general plans for these areas, and the City Housing Exchange, which handled allocation of housing in the new areas, concluded a "treaty" giving priority to people who had jobs in the area; however, this policy proved unworkable.

self-contained satellite cities.[16] After long controversy, a compromise program was finally developed which set aside two areas as garden cities and two as satellite cities. Nevertheless, the Real Estate Director resigned and subsequent development seems to have run along the satellite city lines. It is noteworthy, however, that in order to effectuate these ideas considerable negotiation was required between the government and the business community. While some of the communities were eventually constructed by the Municipal Housing Corporations, others were built by private contractors on a cost-plus basis.

Although advance acquisition has been considered vital to Stockholm's urban expansion policy, there are now a number of other planning devices which are to some extent substitutes for large-scale, long-range advance acquisition. One of the most important of these is regional planning for Greater Stockholm and peripheral communes. The plan covers the physical development of the region only, and there are different levels of detail for various districts within the planning region. All facilities that pass through communes or which affect several communes, as well as the location of major groups of land uses, are incorporated in the regional plan.

The director of the regional planning staff has summarized the process of plan formulation as one of negotiation and bargaining:

> As a result of . . . exchanges of views between different local and regional interests, colored by different forms of living and political opinions, and with the collaboration between the representatives of laymen and experts, a plan was evolved that met, on the one hand, the need for a uniform and balanced framework for the development of the region and on the other hand, the individual claims of the municipalities. There was certainly some measure of suspicion and jealousy at earlier stages and apparently insuperable conflict of interests. But the final plan was adopted unanimously.[17]

It appears that the main difficulties in gaining acceptance arose from the fact that a number of the communes around Stockholm had made ambitious plans for transforming their communities into densely populated areas, whereas the regional planners wished to provide space for various forms of dwellings, industry and recreation facilities. The plan has now been accepted though it is not binding on the communes. There is, however, considerable pressure to conform, and the central government bases its approval of projects on conformance to the plan.

At the local level, further planning functions are exercised. For example, the communes can, by means of their town plans, hinder utilization of land for purposes considered contrary to the public interest. Landowners do not have the right to erect high-rise, high density buildings on privately owned land unless the communes deem such a use appropriate under the town plans. The system of building permits guarantees that existing regulations will be observed by landowners and builders.

Planning has taken a further step toward realizing the benefits of public ownership of land by moving to capture increments in value gained under town plans by private investors. A special ground for expropriation, i.e., for acquiring land to be subsequently leased to builders, and a zonal expropriation arrangement have recently been put into effect. Under these procedures the communes can make application for expropriation at an early stage in the planning

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16. To overcome the plans of the Real Estate Director, proponents of the satellite city concept had to engineer the formation of a new committee to specialize in programs for the Western sector of the city, under the direction of the Building Commissioner, and a new city planning director supported by him. The controversy was thus initially between the politically-appointed commissioner of one division and the civil service director of another.

17. C.F. Ahiberg, "The Regional Plan for the Stockholm Area," *Stockholm Regional and City Planning.* Stockholm, Planning Commission of the City of Stockholm, 1964, p. 37–38.

process and do not have to await the completion of plans, and hence a rise in land prices.[18] The compensation of the private owner is arrived at by weighing the price of similar real estate in the commune and the level of return the owner is receiving on his investment; the use to which land is to be put after expropriation should not be considered, and thus the owner cannot realize profits from values added to land by community action.

Stockholm is a venture from which the full complement of benefits from advance acquisition might have been realized. The purchase was early, the scale was large. How, then, does the record look? A careful answer to this question is a research project. Some observations, however, are possible even on the basis of our cursory examination.

Clearly, services have been provided of a quality and even character not otherwise possible (Benefit Number 2) : transportation and utility systems efficiently related to residences; wooded areas for recreation surrounding each local community. In addition, land use has been improved: subcenters planned on the basis of functional neighborhood units with most of the dwellings within walking distance of schools, shops, recreation and public transport. Whether or not it is possible to interpret these advantages meaningfully in even the roughest sort of dollar measure, it is clear that they *are* advantages and that their full character ought to be understood.

The income from appreciation and rents (Benefit Number 1) is of course present, but how much is impossible to say without careful study.[19] At least it is clear that a large proportion of housing is provided by the city; 45 percent of the housing units built in the past few years were constructed by city building corporations.

As to the benefit from enhancing the power of planning and advance acquisition, in combination, to improve urban development (Benefit Number 3) two interesting facts stand out. First, in spite of the unusual facilities available, and even perhaps partly because of them, disagreement, political wrangling and stalemate interfered with the course of rational progress. Second (to greatly simplify what is really a two-way process), advance acquisition served so successfully to nurture the planning process that the child may now have successfully shelved the parent. Very recent developments appear to have devised a way whereby even Benefit Number 1, appreciation, can be realized through planning without public acquisition of land much in advance of its use.

18. Grants for expropriation are issued by the central government, upon application by the commune. After the communes obtain the grant they must file applications for expropriation with a special court composed of a judge and two technical experts.

19. The city budgets for recent years show only about 6 to 7 percent of total revenues derived from rents and another 7 percent from charges and fees at least some of which are doubtless associated with yields of publicly owned land. (From Institute of Public Administration, *op. cit.* Table on "City of Stockholm Finances," data adapted from Statistical Abstracts of Sweden with additional data from the Swedish Central Bureau of Statistics.) But the meaning of these figures is lost in the intricacies of special departmental budgets and agencies.

Chapter 10

TO BUY OR NOT TO BUY

Advance acquisition of land by public bodies can serve purposes that range from saving money on the production of a particular government service, like fire prevention or education, to providing a new kind of urban environment. The task of the remaining pages is to summarize possible generalizations concerning how deliberative attention directed to whether, when, and how advance acquisition should be undertaken, can contribute to the ends that may be served.

THE PREDECISION DECISION

The first generalization concerns the point at which deliberation starts. It does not start with a decision among alternatives, but with deciding what to decide. The importance of this predecision phase cannot be overstressed.

It is perfectly clear that a good selection among poor alternatives is not a good decision in any meaningful sense. Yet the full implications of this obvious fact are difficult to take into account. To do so implies careful and imaginative attention to devising occasions for considering advance acquisition and searching out specific alternatives worth investigating. Unfortunately, having said this we can say little more; and that is perhaps one reason why the point is ordinarily two-thirds lost. Nevertheless, the predecision rule

had better be formulated: concentrate talent and attention on finding alternatives worth considering.

THE STRUCTURE OF DECISION

Turn now to the decision itself. Theoretically, alternatives have been presented, including the alternative of doing nothing, and the question is how to choose among them.

General Characteristics

The previous chapters have evolved a list of possible benefits and costs associated with advance land acquisition—both those readily formulated in dollar terms and those resistant to quantification. They have suggested how their magnitudes may be measured or at least broadly evaluated.

To recapitulate, the benefits associated with the advance acquisition of sites expected to be used in the production of the usual list of government services are: (1) forestalling rising prices; (2) improving the chances for getting a better site by preventing new private construction on desired land; (3) temporary return on land; (4) better procedure for site selection and planning; (5) improved related land use. Benefits (1) and (2) combined spell more efficient investment of land as an input in producing a service; benefits (3) through (5) add supplementary advantages. The costs are: (1) interest or other opportunity costs of capital; (2) taxes foregone; (3) operating expenses of the program.

When attention turns to advance acquisition as a means of improving the process of urban extension, each of these types of benefit is still present. However, they take on far wider and more subtle meanings; this is particularly true of benefits (4) and (5) which involve the capacity of advance acquisition and planning jointly to improve patterns of land use. Particulars were discussed in the first section of Chapter 9 and need not be repeated.

For each of the benefits associated with advance acquisition, the problem of evaluation, in monetary or other terms, has been discussed and the conclusions need to be briefly reviewed. But consider first how the value of all expected benefits and costs can be consolidated to provide the basis of decision.

First, three general characteristics of the decision situation:

1. The information upon which decision rests concerns expectations, not history. The past or present is useful to decision only as a guide to expectations. In the case of advance acquisition expectations reach well into the future.

2. Expectations about the future can never be sure; instead they are inevitably uncertain. Expected outcomes are therefore described by a value and its likelihood. Thus, each element in the tally of advantages and disadvantages is, in actuality, a guess about outcomes and these guesses may be relatively confident or little more than a vague fear or hope; and this is true whether the benefit is subject to sharp quantification in dollar terms or only to vague hefting. A relatively sure benefit is worth more than a relatively unlikely one: uncertainty reduces value, other things the same. All estimates of outcome, in other words, are twins; there is an estimate of a value (quantitative or qualitative), and of its likelihood.

3. Evaluation of a future benefit or cost must be transposed to its expected value at the time the decision is made. A benefit which will occur ten years hence is smaller, and a cost greater, than one which will occur today; the time discount is basic. Today's decision, therefore, rests on an estimate that converts expected future values to their value at the time the decision is made.

The Decision Matrix

The task now is to draw the materials together into a more structured form—one which deals properly with the inevitable uncertainty of expectations. How may this be done?

Classic statistical decision theory presents a straightforward answer.[1] It is summar-

ized by a matrix and a decision rule. Alternative acts (rows) confront various states of nature (columns), each having a known likelihood of occurring. The outcome of each act under each state of nature has a specified present value (cells of the matrix). The average outcome of each act is the sum of the cell entries for that act (row) weighted by their likelihood, in short, the Expected Value.[2] The decision rule is: choose the act having the largest Expected Value.

Though this conception is far too stiff to apply fully to the complexities of advance acquisition, it is, nevertheless, useful as a conceptual prototype that presents the stark structure of any choice.

The first point to which it speaks concerns the circumstances to which the decision rule applies. An Expected Value can only have obvious relevance to situations that permit successive drawings from a probability distribution. A single drawing, as in the extreme "small-numbers" case, has one outcome only, the one that happened to come out. Any of the results that seem at all likely must be tolerable.

The second point that is sharpened by the matrix concerns the essence of the large-number case. Only if frequent drawings are made is there an opportunity for a weighted average outcome to show up in the cumulative result. The drawings do not, however, have to be made from the same matrix, as when a fair coin is flipped a large number of times. Lloyds of London insures many single drawings from, in effect, a large number of different probability matrices. The average Expected Value (weighted for the size of the venture) will dominate, provided each bet is placed on the basis of a properly constructed and unbiased probability distribution. The Montgomery County or Richmond programs are examples of this sort of situation.

Finally, the matrix and its decision rule have a measure of direct applicability to the advance land acquisition decision of the large-number type in which efficiency—increasing the service output from a dollar spent on the input, land—is a major aspect of the total benefit.

This parallelism is closest when it is possible to develop a consolidated estimate of net measurable benefits of several possible magnitudes for which likelihoods can be roughly assigned. Often such an objective can be approximated because of two characteristics of the decision situation for the large-number case in advance acquisition: (1) Costs can be specified with reasonable clarity and assurance, and (2), the major benefits, the two dimensions of efficiency—appreciation in land values, and obtaining a best site—are subject to dollar evaluation in terms of a range of figures for which probabilities can also be estimated. Accordingly, the Expected Value to the local community of each of the benefits may be summed and the Expected Value of the costs deducted to obtain a net Expected Value of these relatively measurable items.[3] The others can be evaluated thereafter. It will be useful to review for each cost and benefit, what the study has brought out concerning, first, how measurement may be achieved and, second, how probabilities may be assessed.

Costs: Their Amount and Probability

Costs of capital and taxes foregone. These costs are based primarily on the logic of management rather than on guesses about the future.[4] The marginal borrowing rate is an appropriate capital cost for local governments. If capital requirements for advance acquisition are not too large relative to all borrowing, marginal borrowing costs may not be materially higher than the average rate on new borrowing; 3 or 4 percent is a

1. An excellent, readily comprehended description of the essentials is given by Irwin D. Bross, *Design for Decision*, New York, Macmillan Co., 1953.

2. Expected Value is capitalized throughout to call attention to its technical usage.

There is a lively debate concerning whether other rules are preferable, at least at times. However, if the values in each cell represent true utilities (not necessarily with a linear relationship to dollars) most of the argument subsides.

3. A few qualifications are mentioned later.

4. The logic demands that expected changes in borrowing rates or taxes also be considered. But except where holding periods are very long their impact is not controlling.

usable, though perhaps low, estimate. The cost of taxes foregone is a function of real estate tax rates and assessment practices—say about 2 percent of market value of the land. Thus, a 6 percent carrying cost is a conservative estimate for local governments. In any event, the appropriate figure can be estimated in terms of a range for which probabilities can be assigned. The Expected Value and what a decision maker may regard as the "most likely result" may tend to be much the same, or more probable figure will tend to be the same. In general, the costs of about this magnitude (or whatever higher rate is indicated) are relatively sure.

Benefits: Their Amount and Probability

The two aspects of the benefit from increasing the efficiency of public expenditure on land—enjoying appreciation in land value, and getting a "best site" by preventing new private construction on desired land—are measured by the present value of the difference between what the government pays for the advance purchase and the highest price that it would be willing to pay at the time of expected use. However, the benefit need never be smaller than the present value of the appreciation in the value of the site, since the latter benefit can be achieved simply by selling the property at target date. What the government "would be willing to pay" for the land at the time of use is determined by whichever of the following three considerations dictate the smallest figure: (1) the cost of purchasing and clearing new construction from the best site; (2) the price, given the quality, of alternative sites still avaibable; (3) the capitalized value of the services that the site is expected to afford during its public use.

Forestalling a rise in land prices. A general rise in prices tends to increase proportionally what governments would be willing to pay for land (unless consideration (3) dictates a lower limit). Expected changes in land prices are readily conceptualized in terms of possible prices and their likelihood. For example, say that an official knows that a site can now be bought for $100,000. The best information that can be assembled suggests the following estimate: out of ten chances, there are two that the property will be worth $110,000 in seven years; four that it will be worth $140,000; and four that it will be worth $200,000. Thus the Expected Value is $158,000.[5] If the figures applied to a site that was part of an ongoing well-established program in advance acquisition, the figure of $158,000 (an increase of almost 7 percent a year) would be the relevant basis for decision. Over the years, for some ventures appreciation would turn out high, and for others low, but just as long as the estimates were unbiased, the average results would presumably approximate the average of the Expected Values.[6]

Note, however, that if we were dealing with a small-number case in which the venture must stand or fall on its own (and carry its sponsors with it), six out of ten chances of a price no higher than $140,000 might well be too large a chance of loss to take.

Of course, the surer and larger the expected rise in prices, the more advantageous advance purchase will be, other things the same. Chapter 6 indicated that three conditions tend to warrant a confident guess:

1. The transition from rural to urban use appears very typically to involve large increases in value; the upward trend persists

5. It may seem more realistic to describe the judgments in terms of adjectives: there is a "small chance" of $110,000 and "about even chances" of $140,000 and $200,000. However, the numbers are doubtless also sometimes used. Recent experiments at the Bureau of the Census on a survey of consumer buying intentions has found that purchases of durables conform better to respondents' statements about the likelihood of making a purchase when these statements are made in terms of a number-scale from 1 to 10, than when they are made in terms of verbally described likelihoods. See Thomas Juster, *Consumer Buying Intentions and Purchase Probability: An Experiment in Survey Design*, National Bureau of Economic Research, Occasional Paper 99, September 1966, particularly p. 39.

The judgments about both prices and probabilities most often (perhaps typically at least for small lots) refer to prices in a general area rather than for the particular site. If so, the price ranges for the latter are likely to be somewhat broader than the figures suggest. This statement assumes a random variation of prices for particular lots relative to average prices in the neighborhood.

6. This statement is not strictly true since, if some purchases in a program are substantially more costly than others, there is a weighting problem by size of purchase that needs to be taken into account.

(though often at a lesser rate) as development continues in the form of more concentrated residential use. Transition to commercial use tends further to spur the upward trend. Experience suggests, then, that when the transition to urbanization is clearly about to get under way or is actually in process, substantial increases in prices are the norm.

2. For the country as a whole, a long-term rise in urban land prices seems unavoidable, though, except during inflationary periods, there is no reason to assume that the rate of rise will be sufficient to do more than support other reasons than appreciation alone for acquiring land in advance. The fact of the broad trend alone is seldom relevant to the small-number type of advance purchase; is strongly relevant to a situation where the appropriate grouping of purchases is national in scope; its relevance to other groupings increases with the geographic diversity of their coverage.

3. The broad average trend for the country as a whole comprehends substantial dispersion among price trends in particular cities and areas of cities; whether prices in any one of these localities will move with or against the trend depends on particular judgments about the population and about land-use trends of the area. Such questions call for the expertise of the professional on whose judgment, concerning both outcomes and their likelihoods, sound action can be predicated.

Obtaining a "Best Site." Since the power of eminent domain means that a government can always obtain a desired piece of property, the advantage of its advance acquisition involves obtaining it at a lower price than would otherwise be possible. Advance purchase may provide this possibility by forestalling the need to purchase and demolish improvements. A major part of this benefit may be estimated in dollar terms; the rest, the portion involving political feasibility, is an intangible value. The dollar part is commensurable with the benefit of appreciation and should be added to it. It is equal to or less than the value at target date of the new improvements that would have been constructed, in the absence of advance acquisition, plus the cost of their removal.

The benefit is equal to the cost of acquiring and clearing the new improvements and relocating occupants if the particular site remains the most efficient purchase despite the added costs. It is less if there are other properties available at target date that can be purchased for less, after allowing for difference in quality, than the target-date price of the prepurchased site plus the savings from forestalling the need to acquire and demolish improvements. It is also less if the service to be produced on the site does not justify a site of this value, that is, if the capitalized value of the services to be produced on the site over the years does not justify expenditure on land of that magnitude.

Needless to say, only a rough estimate of either of these values can usually be made—of the value of the service to be produced on the land or of the value to the public of differences in quality of sites. However, in principle both are quantifiable. With the conceptual basis of quantification in mind, estimates can be made which are at least informed guesses.

When is the likelihood of getting a best site large and an unneeded one small, other things being the same? The estimate involves prediction of the need for a particular property, its differential advantage over properties likely to be available at the later date, and the likelihood that it would be built upon if it were not purchased in advance. On the latter score, the surest guess can be made if development plans are underway as in the Richmond program. As to predicting need, this too can rest on plans that establish need and simply defer acting on it. Second, characteristics that make a property uniquely suitable are readily recognizable when they are topographical and related to existing development to which its purpose is tied, examples being a park site in a large empty area surrounded by city development, a beachfront property near a city, areas adjacent to existing municipal buildings or streets that require widening. A third aid to identification is the need for schools and other public

facilities, which usually arises when urbanization occurs. This was the situation that made the Montgomery school program so successful; at the other end of the acquisition spectrum, it was the basic characteristic of the Stockholm case. Fourth, since needs for facilities come in sets, the provision of one or more in a set will stimulate need for the rest. Thus, improvement of areas associated with the construction of streets, transportation facilities or urban renewal causes population movements with attendant needs for the usual package of public facilities. Finally, effective planning—either by means of master plans, long-term capital improvements programs or other variants—designates in advance specific properties needed for public purposes; moreover, the capacity of plans to channel development greatly improves the bases for guessing what properties may be required.

The Bases of Choice

Large-number case. The twin aspects of an estimate of the major measurable costs and benefits—the present value of outcomes and their probabilities—have been described. For the large-number case the Expected Value of each of the benefits can be added and that of the costs subtracted to obtain an estimate of net measurable benefits.[7] Intangible costs and benefits then need to be added—costs such as relative political advantage, benefits such as increased viability of planning or improved land use.

For projects that are part of a very large, ongoing program, the Expected Value of the total net benefit for each project is the correct basis for action. Then for the program as a whole, the average of all actual outcomes will come very close to the average of the Expected Values (assuming that they are unbiased).

Small-number case. For the large, unique project, Expected Value calculations are not useful. Instead, all of the outcomes that are real possibilities need to appear tolerable, and the most likely outcomes clearly desirable. The final decision takes these ranges into account. Moreover, when benefits (or costs) of the several sorts seem to be correlated, it is necessary to view them in this associated fashion. For example, if a property were bought and it turned out to lie, as expected, in the path of urban extension, its price would tend to rise and good sites would become scarce. In the event of failure to purchase ahead, structures might have to be bought and demolished. But if the city happened to extend in a different direction *none* of these things would occur. The point is that the combined worst result that seems at all likely, all things (including the intangible values) considered, would need to be deemed tolerable.

Intermediate case. Most actual programs are neither large nor small in an absolute sense but something in between. The direction of even a relatively large ongoing program is sensitive to outcomes along the way for which average results may not have had time to work out. This demands that the basis of action is something between that of the large-number and the small-number case. The attention to the whole range of outcomes advocated for the small-number case in effect takes uncertainty into account by allowing for the *dispersion* of expected results. The net benefit that provides the basis of action tends to be smaller than "the most likely result."

If we translate "most likely result" as "Expected Value," the procedure may be generalized to apply to the real-life situation —the intermediate case—which lies between the two extremes. The rule is: discount the Expected Value for the uncertainty associated with dispersion.

A Short-Cut Method. The bases of choice that have just been summarized for three sorts of programs presumably take the full compliment of costs and benefits, measurable and intangible, into account. But it is often not necessary to go through some of the more difficult and dubious steps of the evaluation for one rather obvious reason:

7. The statement assumes independence among the several benefits and costs and their probabilities. Actually they are no doubt often associated. The text cites an example. The probability distribution of a general efficiency benefit that combined the two elements would tend to have greater kurtosis (be more peaked) than the additive calculation. However, the additive calculation seems simpler to make and adequate for the purpose.

the major costs are reasonably clear and sure. If the figure of 6 percent a year is accepted, then we know that benefits must at least equal this amount.[8]

One way to determine whether they do or not is to start with those relatively easy to measure and move progressively through those more difficult to quantify. For example, if prices were very likely to rise at a 6 percent annual rate—that is increase by 50 percent in seven years, double in twelve years and triple in eighteen—then advance purchase would look pretty good for the reason alone. If in addition, the more advantageous sites would tend to get bought up, then this would add to the benefit from forestalling the price rise. There is no need to go through the exercise of making an educated guess as to what this added advantage would be, providing it seemed substantial. (This assumes, of course, that the site would be needed or if it were not needed that it would be sold promptly). Further, intangible advantages, such as those resulting from more orderly development, may also be expected to add an unmeasured plus quantity to the total result. In another case, it may be necessary to evaluate very carefully in just what ways, and therefore by how much, the improved site would add to the efficiency of land use in order to establish an Expected Value of benefits which, after an appropriate discount for uncertainty, clearly exceeded that of the costs.

OBSERVATIONS ON THE ADMINISTRATIVE SETTING

The analysis of benefits and costs of advance acquisition and the way they need to be conceptualized and combined has logical corollaries in the field of how programs should be administered.

We have made no effort to cover this further problem—administration in the broad sense—systematically. Nevertheless, it is sensible to harvest the suggestions on this subject which arise as a by-product of the study's central concern. The subject is important. Indeed the improvement in decisions that can be achieved by the proper structuring of decision itself may well be minor when compared with the potential of improving the alternatives that are considered and the administrative framework within which choices are made and, particularly, carried out. These include devising ways of reducing risk and developing the proper administrative organization for advance acquisition, and also consideration of acquisition in the context of long-term planning. Moreover, the federal government can help to bolster the effectiveness of state and local land acquisition programs.

Ways to Reduce Risk

Where a risky situation can be identified, the risk can sometimes be avoided or modified.

How this can be done is partly a question of the proper structuring of the decision situation as a whole and partly a matter of administrative procedures.

Picking the time when purchase is undertaken. Since futurity is a source of uncertainty, waiting for time to pass can reduce uncertainty. This is particularly useful when the mere passage of time is assisted by the march of events. The location of streets and sewers and the character of or changes in zoning regulations appeared, in some of the analytic price studies and in the Montgomery County case study, to clarify future developments. Elective timing can sometimes take the form of phasing. For example, a central and essential property such as a lot surrounded by a constellation of city offices can be acquired first; outer edge properties may be bought later as opportunities arise.

But in considering the matter of how the timing of purchasing can reduce risk, it is perhaps paradoxical that injudicious waiting can increase risk or at least reduce the value of the outcome discounted for its probability. This occurs when delay sacrifices the opportunity to purchase at a time when prices are very low and opportunities for advantageous use very high. The point was discussed in Chapter 9.

Use of measures other than purchase in full fee. Options and easements are techniques which incorporate some of the ad-

8. This statement is an approximation since the time patterns of benefits and costs are not identical.

vantages of outright purchase but pay a smaller price for them. Accordingly, they are useful if it is not clear that advantages of outright ownership are sufficient to cover its cost. Subdivision control can reduce the cost still further when subdividers are required to dedicate land for schools and other public facilities as a condition to obtaining cluster zoning or other desirable regulations.

Carrying the matter one step further, public options can be preserved by means of other sorts of regulatory measures. Mapping maintains the right-of-way for streets. Zoning is a tool of broad usefulness. Even marginal cost pricing can, as has been observed, contribute to the orderly extension of utilities into outlying urban developments.

Clarification of the law. The examination of the legal record in Chapter 2 did not suggest that legal restraints had operated as a serious curb on advance acquisition. Nevertheless, there are many areas of uncertainty that could usefully be clarified.

Local governments embarking on an advance land acquisition program would be well advised to check carefully the constitutional and statutory bases for acquiring and disposing of land. In some instances, specific enabling legislation may be desirable, but in any event the action to acquire should clearly state the intent and, where feasible, relate it to the planning and development program of the government. It may even be useful to develop model or sample legislation. To preserve the ability to dispose of land or to use it for some other purpose which may prove more advantageous, the local government in acquiring land should avoid restraints on alienability. Condemnation of the property (the fee simple absolute) will generally solve the problem. And, of course, good faith must be observed.

Administrative Organization

The study has highlighted a number of matters that bear very specifically on how a program in advance acquisition should be organized and administered.

The large-number decision situation. Decisions can be made more advantageously for programs for which success or failure depends on the outcome of a substantial number of individual decisions over a reasonable period of time. The smaller the programs, the more does the need to allow for uncertainty tend to interfere with optimal results. This counsels the central administration of acquisition programs, with jurisdiction over enough work to permit the averaging of over-all results.

Sale as a routine adjunct of purchase. The intrinsic uncertainty of what lies ahead implies that a site that was expected to be needed for the production of a government service will sometimes in fact not be needed, either because the service itself is not needed or because the site is no longer desirable. When this occurs the site must be sold or transferred. It is essential therefore that the administration of acquisition programs clear the way for sale to take place. It is essential also that an error in the administration of the acquisition program be defined not as the liquidation of a mistaken expectation by selling the property, but as the failure to recognize the mistake by retaining the property.

The pinch of costs and the stimulus of gain. Holding land for future use involves a cost. Given the ways of bureaucracy, it is probably important for the operating agencies, for whom land is acquired in advance, to bear the cost of holding it. In any event, efficient management is contingent on managers being aware of the effect of their decisions in terms of their own record of achievement, records on which they are judged by their superiors. There has been no evidence of accounting systems that generate this sort of record of achievement for advance acquisition programs. This lack can only make for less than optimal results.

Inter-agency flow of information. Good information is essential to a well-run advance acquisition program, and some of it is necessarily generated in agencies other than the one in charge of land acquisition. For example, knowledge of where roads or sewers are being planned would help determine whether sites for schools should be reserved. Changes in zoning regulations are particularly important. This set of possibilities for improvement was illustrated in the Montgomery County study. It would be

useful if a government agency involved in advance acquisition had access to this information before the general public.

SOME BROADER IMPLICATIONS

Planning

In many places in this study the potential of advance acquisition has appeared to be interlocked with the potential of planning.

For one thing, a master plan or long-term capital improvement budget provides a basis for forecasting land requirements by supplying information about specific sites that will be needed for specific purposes. Insofar as planning is respected in the community, private action tends to fall in line and cause the forecasts to materialize.

In addition, public plans and associated action concerning all sorts of things having no direct bearing on the need for sites help indirectly to validate that need. Zoning, for example, influences residential use which influences the need for schools.

Planning also provides tools that can be used to validate expectations concerning advance purchase of large tracts of land.

In connection with new cities, and wide-scale acquisition for urban extension, planning and advance acquisition are inseparable parts of a single set of objectives and interlocked techniques for achieving those objectives.

Potential of Intergovernmental Collaboration

Collaboration among local governments in a metropolitan area, or among state and local governments, can fortify advance land acquisition programs in at least two ways. First, the collaboration promotes the large-number decision situation with its attendant advantages. Second, by adding a more comprehensive dimension to planning, it improves in each of the ways mentioned above, the viability of an advance acquisition program.

Potential of Federal Action

We have discussed ways in which local governments and their collaborative efforts can improve the effectiveness of advance acquisition programs. However, there are four areas in which a far wider jurisdiction has a significant role to play.

Creating the large-number decision situation. Federal interest in local programs affords the advantage of a broad jurisdiction. A small-number decision for a locality can be converted to a large-number decision for the country as a whole. Chances that must be handled as unique or small-group cases for a town, and therefore must pay off on an individual basis, are pooled if the federal government undertakes the role of insuring against loss on an actuarial basis. Moreover, in the national context, broad rather than local land-price trends govern the amount of average appreciation.

The excessive time discount of government officials. Advance acquisition offers future, not present, rewards to the decision maker. Officials of local governments inevitably value the latter far more than the former. If so, decisions to acquire properties in advance are in actuality being required to cover a time discount not of the 4 percent or even the 6 percent that we utilized in our calculations, but of a substantial further discount which represents the politician's preference for present reward. It is measured by the amount by which a reward offered five years hence must exceed a reward offered today in order to be preferred to it. If advance acquisition is to compete on an even basis with other forms of local government expenditures, this extra time discount may often need to be carried by the federal government. This is perhaps an important justification for federal aid to local acquisition programs.

Inadequate evaluation of benefit to future generations. Even time discounts that do not have the politician's bias may fail to give proper weight to benefits for future generations. Land use is often irreversible. If open land is incorporated in a city, the opportunity to use it for recreation or beautification is permanently foreclosed. Yet the need for such open space increases as population in the area increases. This *intensification* of need, that is, the increased utility of the service that the land produces, is not readily

recognized by local governments. But in the context of nation-wide planning its importance stands out and provides a further reason for federal facilitation of advance land acquisition.

Benefits External to Localities

The nation as a whole benefits from well designed land use in local areas. These benefits, which are over and above those accruing to local residents, may be of several sorts. Residents of one town benefit from parks or well designed land use in neighboring towns. They benefit from such amenities in any town insofar as they may, for other reasons, wish to move there. But in a broad sense, since well designed land use is an aspect of the "good life," its manifestation anywhere in the country is advantageous to all.

Investment in Land as a Source of Government Revenue

The pervasive series of interrelationships that this study has encountered reintroduces an old question for new reasons: Is investment in land and the income derived therefrom a proper source of revenue for governments?

Government has for good or ill become responsible for stemming the process of urban decay and improving the process of urban development. It has become responsible for reconstituting decaying areas, for providing transportation, water mains within streets, clean air above them. Governments, in other words, are creating urban land values by channeling large quantities of public funds into this essential work. Advance acquisition of land is a tool in pursuing this work.

But ought it not also be thought of as a potential source of revenue? The question seems insistently put by the material that we have reviewed. An answer would need to consider the justice of causing the benefit from the results of public investment in urban development to accrue directly to the public rather than to private builders, real estate interests and property owners. More particularly, it would have to consider the overall impact on economic welfare of substituting transfers achieved by government investment in land for some transfers from the private to the public sector that are achieved by means of taxes or bond issues.

APPENDIX

TWO QUESTIONNAIRE SURVEYS: THE QUESTIONS AND TABULATION OF ANSWERS

(The Material Presented Here Supplements The Discussions In Pages 16 to 18)

Early in 1966 the National League of Cities and the National Association of Counties conducted a questionnaire survey on advance acquisition of land for public purposes. The Institute of Public Administration analyzed the returns. This appendix presents the questionnaire along with the tabulations and analyses associated with each question.

The Sample

The city questionnaire was mailed to the entire direct membership of the National League of Cities. These were all cities that were dues paying members of the NLC, rather than members by virtue of their membership in the various state municipal organizations. They are considered a representative group of American cities in each size category above 50,000 population. The county questionnaire was mailed to 117 selected counties—those counties with planning directors who were members of the National Association of County Planning Directors. It seems likely that the basis of selection would increase the likelihood of advance acquisition programs because of the close relationship between planning and advance acquisition. If so, the sample counties are more likely to have advance acquisition programs than otherwise comparable counties.

Number of Advance Acquisition Programs

Question 1. Is there in your city (county) a program for acquisition of land in advance of intended use? Yes____ No____

If yes, for how long has the program been in operations? _____ Years

Question 2. In about how many instances has land been acquired in advance of need?

	Number
a. 1 or 2 years ahead	_____
b. 3 to 5 years ahead	_____
c. Over 5 years ahead	_____
d. About when were the first of these properties acquired?	_____

Table A

CITIES AND COUNTIES SURVEYED AND QUESTIONNAIRES RETURNED AND REPORTING ADVANCE ACQUISITION OF LAND

	Cities			Counties		
	Number of Cases	Percent of Mailings	Percent of Answers	Number of Cases	Percent of Mailings	Percent of Answers
Questionnaires Mailed	306	100		117	100	
Returned	144	47		57	49	
Not Returned	162	53		60	51	
Questionnaires Completed and Returned	144	47	100	57	49	100
Reporting Advance Acquisition Program [a]	73	24	51	18	15	32
Reporting Occasional Advance Acquisitions	32	10	22	12	10	21
Reporting No Activity	39	13	27	27	23	47

[a] Whether or not a city or county had a "program" was indicated primarily by its answer to question 1 — "Is there in your city (county) a program for acquisition of land in advance of intended use?" A "no" answer was taken literally. In a very few cases a "yes" answer was thrown out because the number of cases reported seemed too small to be meaningfully interpreted in terms of a "program."

The returns for cities (but not for counties) were classified by city size. They showed that programs are somewhat more usual for the cities in the 100,000 to 500,000 population group than in either the largest or smaller cities.

Table B

ADVANCE ACQUISITION OF LAND, BY CITY SIZE GROUPS

	Population Group							
	Over 500,000		100,000-500,000		Under 100,000		Total	
Cities Reporting	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Program of Advance Acquisition	10	42	28	60	35	48	73	51
Occasional Advance Acquisition	5	21	10	21	17	23	32	22
No Advance Acquisition	9	37	9	19	21	29	39	27
Total	24	100	47	100	73	100	144	100

But the frequency with which advance acquisition is reported in the questionnaires does not necessarily describe, even very approximately, its frequency among the NLC member cities. It does so only if there is no difference with respect to land acquisition in the cities that did and those that did not return the questionnaires. Yet it seems probable (and discussion with officers at the NLC support the notion) that cities having no program of advance acquisition are unlikely to answer a questionnaire; they have no one to fill it out and, besides, nothing to report.

Following this line of thinking the figures in Table C were developed. The second column is based on the extreme assumption that *all* of the programs in the sample were to be found in the cities that filled in questionnaires.

Table C

PROGRAMS, BY CITY SIZE, RELATED TO VARIOUS SAMPLES

	Percentages		
	Programs to Questions Answered	Programs to Cities Surveyed	Cities Surveyed to Cities in US [a]
All Cities in Group	51	24	10
Over 500,000	42	40	93
100,000-500,000	60	35	65
50,000-100,000	53	23	42
Under 50,000	40	12	4

[a] Cities over 5,000 population only.

Source: Classification by size based on population data in *The Municipal Year Book*, 1966.

The data show a marked decline in the frequency of programs as city size declines. Since there must certainly be some programs in the non-reporting cities, the level of the figures is doubtless low. For example, more than 24 percent of the NLC membership probably have programs; but the correct qgures seems likely to be much nearer 24 percent than the 51 percent that applies to the proportion of the returned questionnaires that reported programs. (Top line of Table C.) Further, there seems no reason to suppose that the ratio of unreported to reported programs for the membership as a whole should differ materially by city size. Accordingly, we conclude that programs in the smaller cities having League membership are far less usual than those in the very large ones—something of the order of one-third as frequent.

Do these figures provide any basis for hazarding a guess about the incidence of advance acquisition for the country as a whole? The answer depends, of course, on the size and characteristics of the NLC membership for the several size categories. In general, officials of the League believe that their national member cities do not have characteristics that would tend to make their behavior with respect to advance land acquisition systematically different from that of other cities of about the same size. If so, conclusions concerning the incidence of advance acquisition for cities of the several size groups among the NLC membership may throw some light on the presence or absence of programs in other cities in the country of the same size.

However, for the very smallest cities, those under 50,000 population (of which there are about 100 among the national membership of the NLC) is too small a portion of the total in the country to provide an adequate sample, however well randomized it may be.[1] For this group then, no conclusions for the country as a whole are possible.

[1] Actually it is not a random selection since cities of under 50,000 people are only eligible for membership if they are one of the 10 largest in the state or a state capital.

For the largest cities, those of 500,000 or more people, it is clear that something called a "program" of advance acquisition is present in about 40 percent of the 27 cities in the country, since all but two are in the sample and virtually all answered the questionnaire.

For the 100,000 to 500,000 group, the NLC sample includes about two-thirds of the size group for the country. However, substantial non-response leaves the incidence of programs ambiguous— it can be no less than 35 percent but it could be substantially larger. But the guess has something else to go on: in view of the systematic association between advance acquisition and city size, the ratio for the largest cities—about 40 percent—can be thought of as an upper bound for the next 100,000 to 500,000 group. If so, the smallest estimate—35 percent—may not be far from correct. Though the figure may be low for the NLC membership, the membership itself may be a bit more likely to have programs than other American cities in that size class. It seems reasonable to suppose that NLC members are more likely to be more than less progressive than non-members.

All in all, if we were forced simply to make the best guess that we could about the incidence of advance acquisition in American cities, we would point to the three figures in column 2 (Table C)—those for cities of the three largest size groups. Weighting each by the number of cities in each class in the country as a whole produces the figure of 28 percent. The choice of this basis of estimation assumes that two errors tend to counteract each other: the figures in column 3 are somewhat low to represent accurately the frequency of programs for the NLC sample as a whole, but, with the exception of the largest cities, the NLC samples may have a higher incidence of programs than do the cities of comparable size in the country as a whole.

Our guess then, and it is no more than a careful guess, is that perhaps one-third of the cities of over 50,000 population have programs of advance acquisitions, albeit, as it will be seen presently, they may often be very small programs. If one were to include the smaller cities, the figure would, of course, drop way down.[2]

For counties, the information is too incomplete to provide a basis for extrapolation. Clearly, however, the programs appear to be infrequent and small in size.

Characteristics of Advance Acquisition Programs

The survey asked a number of questions about the characteristics of land problems confronted in advance acquisition programs. The substantive findings are given in the text of Chapter 2, pages 16 to 18. The questions and tables are presented below without further discussion.

[2] According to the 1966 *Municipal Year Book* there are 27 cities over 500,000 population; 123, 100,000 to 500,000; 232, 50,000 to 100,000; and 2,812, between 5,000 and 50,000.

Age:

Table D

AGE OF PROGRAM

Age of Program	Number of Cities Reporting	Percent of All Cities Reporting Program	Percent of All Counties Reporting Program [a]
0 to 3 Years	7	27	56
4 to 6 Years	13		
7 to 9 Years	8	44	28
10 to 12 Years	14		
13 to 15 Years	10		
16 to 20 Years	7	26	11
21 to 25 Years	1		
Over 26 Years	11		
Unreported	2	3	5
Total	73	100	100 [a]

[a] There were 18 counties that reported programs.

Size of Programs:

Table E

FREQUENCY DISTRIBUTION OF PROGRAMS, BY THE TOTAL NUMBER OF ACQUISITIONS REPORTED

Number of Acquisitions [a]	Cities Reporting		Counties Reporting [b]
	Number	Percent	Percent
1 to 5 Cases	16	22	22
6 to 10 Cases	17	23	17
11 to 15 Cases	7	10	17
16 to 30 Cases	5	7	5
31 to 50 Cases	4	5	—
Over 50 Cases	6	8	17
Unreported	18	25	22
Total	73	100	100 [a]

[a] Advance acquisition is defined as land purchased three years or more in advance of expected use.
[b] There were 18 counties that reported programs.

Table F

FREQUENCY DISTRIBUTION OF PROGRAMS BY THE AVERAGE NUMBER OF ACQUISITIONS PER YEAR

Number of Acquisitions Per Year [a]	Cities Reporting	
	Number	Percent
Under 1 Case	15	20
1 to 5 Cases	29	40
6 to 10 Cases	7	10
11 to 15 Cases	2	5
16 to 25 Cases	1	
26 and Over	1	
Unreported	18	25
Total	73	100

[a] Advance acquisition is defined as land purchased three years or more in advance of expected use.

Table G

MAJOR MOTIVES FOR ADVANCE ACQUISITIONS

Reason	Number of Cities Reporting	Percent of Cities with Programs	Percent of Counties with Programs
To Forestall Rising Land Prices	59	81	83
To Secure the Best Location	56	77	78
To Avoid Demolition Costs	21	29	22
Other	31	42	50

Note: Respondents typically reported several reasons.

Motives:

Question 3. What have been the major reasons for advance acquisition? If more than one, please underline the most important.

Check (and underline)

a. To secure the best location _____
b. To avoid demolition costs _____
c. Rising land prices _____
d. Others: _____ _____

Purposes:

Question 4. For what public purposes is land acquired in advance? Please rank them by relative importance.

	Rank (1 is high)	Agency Responsible
a. Schools	____	____
b. Parks	____	____
c. Government buildings	____	____
d. Fire stations	____	____
e. For purposes of influencing orderly development of fairly broad areas	____	____
f. Industrial park development	____	____
g. Public off-street parking	____	____
h. Other: ____	____	____

Is advance purchase for any of the purposes you have checked done under what could be described as a separate program? Yes____ No____

If yes, please name (in the column provided) the agency responsible for it.

Table H

INTENDED USES OF SITES ACQUIRED IN ADVANCE AND IMPORTANCE RANK[a]

	Ranking by Cities				Counties
	First	Second	Third	Total for First Three Places	Total for First Three Places
Schools	31	9	2	42	9
Parks	19	19	11	49	14
Government Buildings	5	8	11	24	3
Fire Stations	1	9	18	28	1
For Purposes of Influencing Orderly Development	2	4	2	8	1
Industrial Park Development	2	7	2	11	1
Public Off-Street Parking	2	4	9	15	—
Street Widenings	8	4	2	14	—
Other	9	9	3	21	8

[a] Respondents did not always select a third rank and in six cases they assigned two first ranks. Purposes assigned lower than third rank are not included in the Table.

Operation of Programs

Assessment of costs and benefits:

The information conveyed by answers to question 5 is discussed in the text, Chapter 2.

Question 5. For properties which have been acquired in advance, is there an appraisal of market value made before the property is put into use? Yes____ No____

Are carrying costs (e.g., interest payments and lost taxes) on holding land for future use calculated? Yes____ No____

If yes, please describe ____

Methods of reserving land:

Question 6. Is land reserved for future public use by methods other than acquisition of fee simple? Check

a. Easements _____
b. Options _____
c. Mapping _____
d. Subdivision control _____
e. Utility extension policy _____
f. Other: _____ _____

Table I

METHODS OF RESERVING LAND OTHER THAN BY PURCHASE

Methods	Number	Cities Using Percent [a]	Counties Using Percent [a]
Easements	47	64	39
Options	19	26	28
Mapping	17	23	11
Subdivision Control	54	74	61
Utility Extension Policy	10	14	—
Other	24	33	44

[a] The base of the percentage is all cities and counties reporting programs.

Other characteristics:

The information conveyed by answers to questions 7 through 11 is discussed in the text, Chapter 2.

Question 7. Does your city (county) have a program that considers the desirability of reserving for future public use properties acquired through tax delinquency? Yes____ No____

If yes, what department is responsible for the program? Dept. _____

Question 8. Are there any particularly troublesome legal restrictions on advance land acquisition in your city (county) or state? Yes____ No____

Please describe _____

_____

_____

Question 9. Are there any restrictions on the source of funds you can use for advance land acquisition in your city (county) or state? Yes____ No____

For example, which of the following *can* be used? Check

a. General fund revenues _____
b. Unappropriated surpluses _____
c. Capital reserve funds _____
d. Special revolving land acquisition fund _____
e. Bond issues _____
f. Public Law 89–117 (see enclosure) _____
g. Other: _____ _____

Question 10. Are there any other impediments to advance acquisition? Yes____ No____

Please describe _____

_____

_____

Question 11. Has there been any evaluation of the effectiveness of advance acquisition in your area? Yes____ No____

If so, is this available in published or unpublished form? Yes____ No____

If yes, please include a reference.

_____

_____

Comments: _____

_____

_____

Questionnaire Prepared By:

Name: _____

Title: _____

Agency: _____

Address: _____

_____ Date _____

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